

Economics and Politics of Shale Gas in Europe

Chi Kong Chyong and David M. Reiner¹

Executive Summary

As in many other regions, the success of unconventional gas in the United States, has generated interest in many European capitals in replicating that experience. The appeal of shale gas exploitation is driven by a combination of concerns over the impact of rising energy costs on industrial competitiveness and the perceived risks of disruptions to European gas supplies from increasingly more serious political crises along its eastern border in Ukraine.

Analysis of a possible shale gas revolution in Europe have largely drawn from the US shale gas experience to understand the economic, political and environmental impacts. Most economic analyses assume averages for such important parameters as well productivity and drilling performance. The conclusion they make based on these analyses is that the economics of shale gas in Europe is marginal, and that environmental and other constraints (e.g., upstream service sector) could undermine the economics and hence if shale gas in Europe is to be developed at all, it would occur at a much more modest scale than in the U.S.

However, applying average well productivity and/or costs ignores a crucial fact that only a small fraction of wells drilled are critical to the overall economic success of any shale gas lease. The developer's objective is therefore to understand why certain wells succeed and how to replicate the success for subsequent wells. In other words, economic analyses that rely

1 Both from Energy Policy Research Group, Cambridge Judge Business School, University of Cambridge. Corresponding author: k.chyong@jbs.cam.ac.uk

on average numbers do not reflect the reality of shale gas production economics. A more robust way to treat uncertainties surrounding shale gas economics is to conduct a stochastic analysis of its main components (well productivity, cost along the value chain, drilling productivity etc.).

The risks and uncertainties associated with conventional gas production are minimal compared to shale gas production. By contrast, exploration for shale gas is not a risky business since shale gas is a source rock and is abundant; rather, the risks of shale gas development are shifted from the exploration phase to the production phase because shale gas extraction is much more complex and well productivity varies greatly even within the same shale formation.

The highly stochastic nature of shale gas production favors small exploration and production companies with greater flexibility and higher risk appetites. In other words, traditional oil and gas integrated majors, being more risk averse than smaller independents, operating in the same (risky) environment would take a more cautious investment strategy. Risk-taking is essential for successful shale gas production due to the need for improved geological knowledge and operational efficiency, which ultimately lie at the heart of cost reduction.

The very steep decline in the production rate of shale wells means that shale producers would require access to local markets to monetize their reserves. In particular, access to the pipeline network and cost of access is an important factor. Thus, liquid, transparent and competitive wholesale gas commodity and transportation markets are essential to the success of shale gas in Europe. Further, the risk profile of independent shale producers is concentrated on production and traditional hedging such as moving along the gas

value chain (e.g., by moving downstream) is not effective, they would require financial risk hedging tools to shield their production positions.

In spite of moderately sized reserves and growing energy security concerns, a number of EU member states have chosen to effectively shut down exploration in the face of widespread public and NGO opposition. Several of Europe's largest gas markets, including France, the Netherlands and Germany, which together constitute over a third of the EU's gas market, have various forms of moratoria on shale gas exploration. On the other hand, energy security is a major driver of shale gas development in Poland and a number of other central and eastern European countries. However, these markets are generally small compared to northwestern European markets, are the least liberalised in the EU, and gas pricing remains regulated or dominated by oil indexation mechanisms. The economic fundamentals for developing shale gas are most attractive in the UK since it has the largest and most liquid market in Europe with rising energy security concerns and a strong government commitment to supporting shale gas activities. The major obstacle is likely fending off public, particularly local, opposition to exploration.

Given the recent developments in Ukraine, European policy makers seem to favor developing shale gas as an option for Europe to diversify its gas imports away from Russia since other suppliers (overseas LNG, Middle East and

North Africa etc.) are not very promising in the short to medium term. A more problematic question, which affects both the economics of conventional gas supply options to Europe as well as European shale gas is the future of gas in Europe over the medium term (2025-2030). Diversification away from Russia requires large investment in economic and political capital to develop shale gas and promote investment to develop infrastructure outside Europe. Investors who would undertake those investments will require greater clarity

as to the future of the gas markets in Europe that extends beyond shale gas in particular.

Given recent developments in European energy policy, particularly the renewables directive, natural gas has been priced out of energy markets in Europe.