

Steve Jewell, director of global wells and subsurface at Aberdeen-based energy consultancy Xodus Group, says any oil company that ignores the potential of unconventional gas does so at its peril. (Images courtesy of Xodus Group)

The Race For the Unconventional Prize in Europe Is On

Unconventionals are the biggest game changer the industry will see. Everyone knows this is the future.

Europe's oil and gas industry is undergoing a marked transition, and any oil company that ignores the potential of unconventional gas does so at its peril. The unconventional gas revolution is on the brink of explosion, with oil majors ambitiously vying for first mover advantage in what is considered to be the next big hydrocarbon prize in Europe.

Unconventional gas is where the biggest opportunities lie for the world's energy companies as the pressure grows to replace reserves in a world where hydrocarbon consumption continues to rise.

The upstream business is turning to unconventional sources as a means of securing long-term future supplies and also to provide the scale of resources needed to balance reserve portfolios and to protect corporate balance sheets.

This is the beginning of a major new industry in Europe, an oil and gas frenzy, as the majors consolidate plans to get the revolution underway.

2011

The year ahead will be a defining time, with Europe looking beyond conventional supplies of natural gas, coal, and oil. These traditional energy sources are depleting, and the increasing dependence on imported gas in particular could prove risky in political and security terms. Shale gas and coalbed methane (CBM) can provide abundant, secure, and cheaper energy.

The primary target is unconventional gas, which is derived from shale or CBM extraction and accounts for more than 10% of U.S. domestic gas supply. Australia also is an established producer, with emerging nations including China, India, and Indonesia, all of which have seen pilot developments spring up in the wake of significant drilling in the last few years.

Now a number of countries, especially Poland, Germany, France, and the Benelux, have been targeted as hunting grounds for CBM and shale prospecting. In the U.K. alone, analysts have predicted CBM reserves of 2.9 Tcm, or 29 years' worth of current gas consumption.

In Europe, major hurdles need to be overcome to make the industry as successful as its U.S. counterparts, but the mindset has firmly changed with the startups, mid-caps, and supermajors at last realizing the vast commercial potential of what was once perceived as merely source rock.

While the opportunity to drill into the U.K.'s coal seams is an exciting prospect, it can cause problems. Extraction is commercially challenging and is dependent on a number of key technical parameters: the gas content of the coal; the thickness of the target coal seams; and the permeability of the coal, which dictates the speed of extraction.

U.K. coal beds tend to be thin, deep coal seams that lend themselves well to horizontal well drilling, traditionally a high-tech and high-cost solution.

Overcoming Hurdles

Oil and gas companies already have taken the first steps in overcoming the challenges of CBM development in Europe in a stampede for land and licenses, acquiring huge tracts of acreage across the continent. Weeks ago, it was reported that the North Rhine Westphalia, Germany's most populated state and the heart of the country's mining and utility industry, awarded exploration licenses to **ExxonMobil** and nine other operators to search for unconventional gas.

"Big Oil" already has increased its stakes in the U.S., with ExxonMobil earlier this year making its most significant purchase in years by buying up shale producer **XTO Energy Inc.** for US \$30 billion. This sort of activity has been followed by a heating up of the mergers and acquisitions market in the sector after a slow post-recession recovery. Reports that Shell is willing to sell off some of its Nigerian oil assets, where rebels regularly attack production plants, is another clear sign that majors are shipping out of hostile terrain for safer projects.

The U.S. Department of Energy estimates shale gas will provide 50% of the country's demand within 20 years. It is often said that what happens in the US today will be repeated in Europe tomorrow. Although this was said about CBM in the '90s, it did not happen. It also has been said about shale, but in the last five years, drilling activity levels have been relatively modest. There are three fundamental reasons why shale gas development has not worked and why Europe has not been able to easily repeat the success of the U.S.--mineral rights, land access, and an underdeveloped drilling service sector.

A challenge to conventional thinking in these critical areas is urgently needed if Europe is to commercialize its unconventional potential and secure what is probably the largest remaining hydrocarbon resource on the continent.

Land mineral rights are not the same in Europe as they are in the U.S., and the rights of

landowners might become a barrier to progress.

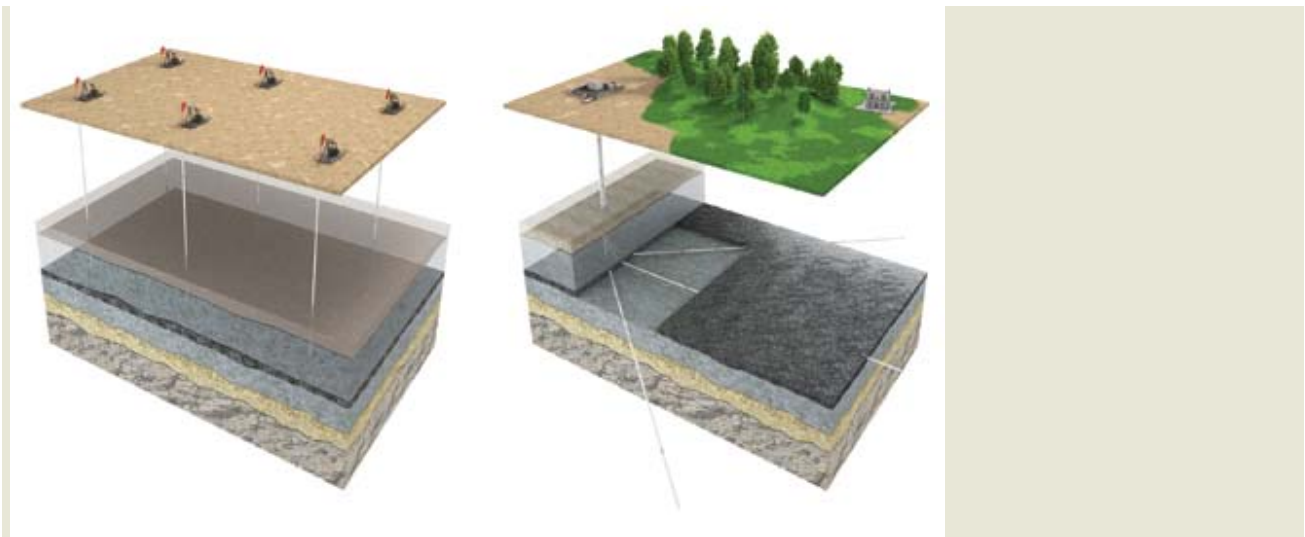
Landowners in the U.K. do not gain the same economic benefit for allowing drilling on their land because petroleum mineral rights belong exclusively to the Crown.

Europe also needs to encourage activity to promote the natural growth of the well drilling and support infrastructure; otherwise, the costs of well construction will never reach the U.S. levels needed to make the economics viable.

Also there is a dearth of drilling and service companies in the U.K. and the continent to support shale and CBM development. There are very few rigs and little fracture stimulation equipment available, and the infrastructure does not exist to perform factory-type drilling and repeat operations. This makes getting the job done very difficult and can introduce execution delays that directly impact the economics of a potential development.

Another roadblock to better commercial development is land access. Like most of continental Europe, the U.K. is very densely populated. Drilling would require many wells on large areas of land. Consent and approvals take time to process, therefore increasing costs.

Then there is the environmental factor. Communities need to be persuaded that the impact of unconventional hydrocarbon development in their backyards will be as safe and as unobtrusive as possible.



Xodus Group is designing novel well-design concepts applicable to both CBM and shale gas accumulations to try to reduce the number of surface wells and quicken the drilling process.

To try to reduce the number of surface wells and quicken the drilling process, **Xodus Group** now is working on designing novel well-design concepts applicable to both CBM and shale gas accumulations.

One of those developments is a multi-well drilling pad that would permit the drilling of as many as eight horizontal wells from a single location. This would significantly reduce the number of surface locations required. The design would decrease environmental impact and would provide flexibility to permit development in densely populated areas.

The eight-well pad is at the concept stage, but it is a potential means of exploiting directional drilling technology to achieve maximum reservoir exposure at minimum cost and with the lowest visible environmental impact possible.

Another environmental challenge is water management. Produced water from CBM operations needs to be managed carefully to avoid unforeseen environmental impact. The sourcing and subsequent disposal of water for the massive frac treatments needed to develop shale gas also will present significant challenges to the industry.

Water sourcing and abstraction generally will not be a problem in Europe, but the disposal of produced water will require careful management.

In the end, successful unconventional operations really are about good housekeeping and being a good neighbor. All of the energy is needed in the long term, and developing it in a sensitive way using all of the technology available will be what underpins the delivery of the unconventional energy prize in Europe.