

# A timely blessing or faltering prophecy?

*Expectations remain high that shale gas can provide the world with a clean and affordable source of energy.*

*However, companies cannot succeed in its commercial extraction without firmer gas prices and public support.*

*Ruud Weijermars\* and Crispian McCredie, Alboran Energy Strategy Consultants, examine the main challenges and opportunities that lie ahead for Europe.*

The majority of energy outlooks published by major energy agencies see gas production overtaking oil and coal in the next 20 years. Coal needs to be reduced to meet greenhouse gas emissions targets and oil is perceived as an increasingly expensive fuel. Gas is hailed as Europe's transition fuel. In the US, shale gas has brought down fuel prices for US power stations and displaced coal.

The upbeat reports about the meteoric rise of North American shale gas output are supported by solid production data. Figure 1 shows how natural gas produced from shale, tight sands and coal beds has compensated for the loss of production due to the decline of gas produced from US conventional sources. At the end of 2012, shale accounted for 24% of US gas production, with an additional 10% imported from Canadian shale gas fields.

The development of North America's unconventional gas resources enhances security of supply. Some reports suggest that the US will be self-sufficient in energy production by 2035 and could see US shale LNG exported to Europe. Should this event occur, there will be significant ramifications for Caribbean, Middle Eastern and Russian gas exports. However, for European shale gas to be commercially available in the foreseeable future, companies must be enabled to engage in meticulous financial and operational planning.

## Economic risk

When it comes to assessing the economic performance of the North

American shale gas industry, there is only one conclusion – the US shale gas industry is an economic shambles. Poor corporate planning and miscalculation of the North American gas market demand has led to overproduction and depressed US wellhead prices to such an extent that the gas bills of US consumers are in effect subsidised by the gas producers, or rather the producer's stakeholders. North American gas prices have been so low over the past

five years that gas sales met only about half of the real costs incurred by producers.

Shale gas news concentrates on the brave promise for the future, not the poor economics of the US shale gas industry. There are numerous documented examples where North American shale gas projects have been started based upon overly optimistic estimates of well production combined with too high gas price assumptions in the cash flow projections. These case studies should be carefully reviewed when calculating the expected returns from shale-producing areas outside North America.

## Europe's gas gap

Europe's gas demand forecasts are based on fairly precise energy system models with reasonable boundary conditions. These models guide both gas producers and traders on how much gas must be produced and imported to meet demand forecasts. For Europe, it is becoming increasingly difficult to meet future gas demand at affordable prices. Unlike the US, where the gas price has

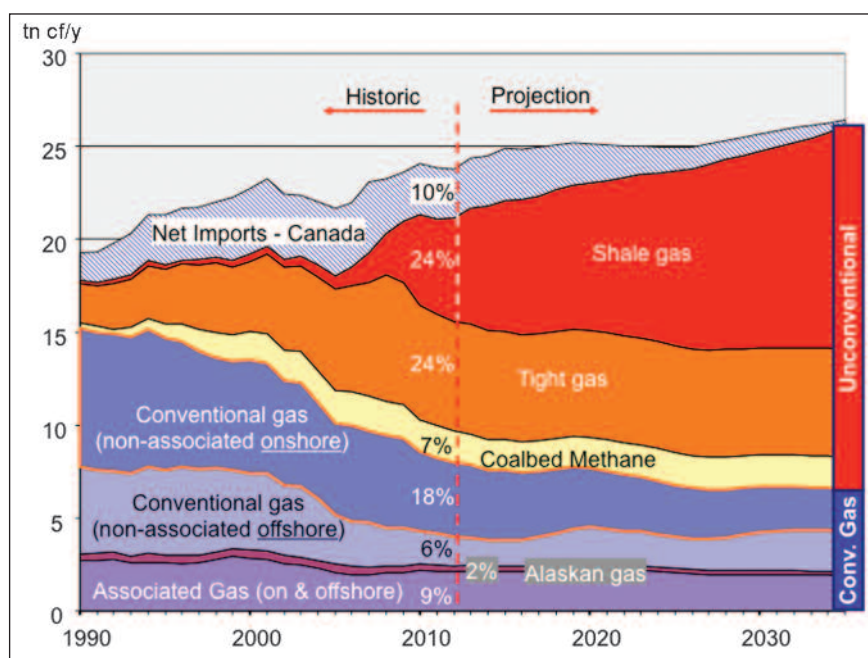


Figure 1: US historic gas production record and forecast to 2035  
Source: US Energy Information Administration, Department of Energy

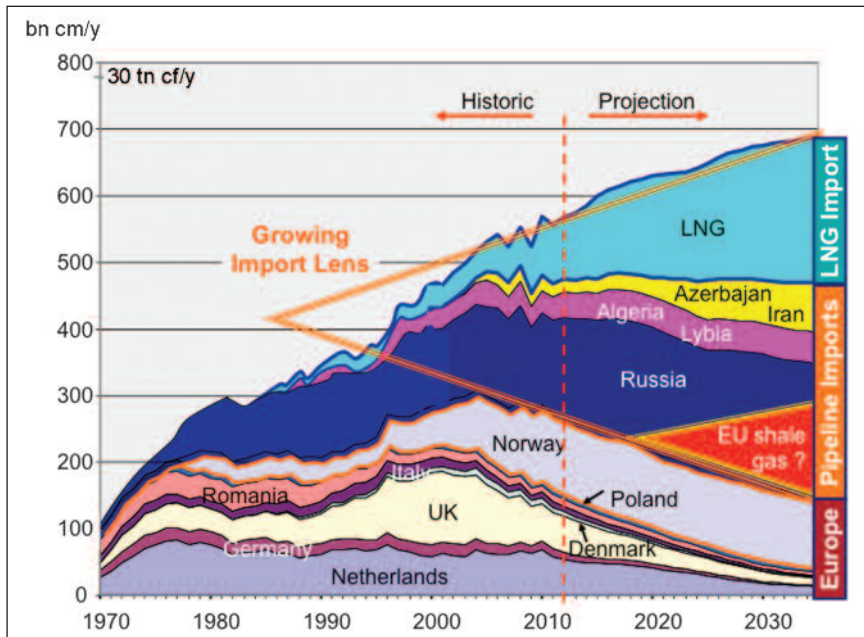


Figure 2: Europe's historic gas production record and forecast to 2035 (Source: Alboran research); inset – The most optimistic shale gas development scenario according to a recent EU report<sup>6</sup>

collapsed, European gas prices remain high both in the UK and in Continental Europe, because a large proportion of wholesale gas must be imported from afar.<sup>1-5</sup>

Figure 2 shows how in 2012 more than half of the gas came to Europe from Russia, Asia and Africa, either by long-distance pipeline or LNG shipments. For this reason shale gas development becomes irresistibly attractive to governments, because it would provide a new indigenous supply source that could help temper further rises in European gas prices and assist European industrial economic growth, whilst at the same time reducing the security of supply risk.

At present, both Europe and Asia are net importers and compete for gas supply from Russia, Asia, Africa and the Middle East. Whilst the Chinese government has already fully committed to the development of its domestic shale gas resources, in Europe there is a mixed picture as individual sovereign nations decide whether to take part in the projected global shale gas bonanza.

### European potential

Exactly how much shale gas Europe possesses is still unconfirmed, although barely a month goes by without another lengthy report appearing on shale gas resources. The updated International Energy Agency (IEA) figures for technically recoverable unconventional shale gas suggests European shale resources are small relative to the other continents, but still amount to about 18tn cm

of technically recoverable gas resources.<sup>7</sup> That amount of gas would be enough to meet all of Europe's gas demand for a quarter of a century.

Just how fast Europe can develop its shale gas resources depends on many factors. The key requirement for shale gas operators to develop Europe's shale gas potential remains the need for a positive adjusted risk return on investment above the operator's corporate project hurdle rate. If the downside risk is too high, only a few players will enter the game. Each European government with a geological endowment of shale gas must decide whether to go ahead with shale gas extraction licences and then must provide adequate steps to assist operators to mitigate the shale project risks.

### Risk mitigation

Companies and their financial backers will only engage when they are able to quantify the risks as they rank the likely returns from shale gas extraction against other proposed projects. Regional variations in well productivity, future gas price fluctuations and the time taken for well roll-outs are critical factors in the cash flow equation. Consequently, regulations must help minimise gas price volatility. Governments will need to reduce permit delays that control well roll-out schedules, which impact heavily on companies when shale projects are frozen due to political decisions rather than by operational failures.

Some key factors for successful risk mitigation in shale gas development are highlighted below:

#### Land rights

The extent to which landowners own the subsurface rights to the potential shale gas deposits will affect their readiness to support shale gas projects. Each European country has its own laws relating to property and, in many cases, subsurface mineral deposits belong to the State. To accelerate shale gas development, where rights are owned by the State, European governments should consider sharing shale gas proceeds with local communities to overcome any hostility that may arise due to the disturbance caused by drilling operations. This will also require the adoption of new mineral rights regulations such that landowners could directly benefit from the proceeds of shale gas below their properties, as in the US.

#### Licences

The granting of E&P licences in Europe for cash strapped governments may be seen as another source of income for their treasuries. Governments must refrain from adding to economic uncertainty by ill-considered shale gas taxation. Australia and Poland appear to be progressing in providing the most attractive shale gas resource development incentives. China and Russia are also taking measures to help develop their shale resources. Meanwhile, in the European Union (EU), France and the UK have issued recommendations addressing shale gas development.

#### Drilling programmes

Whilst multiple wells drilled from a single drilling pad will reduce the environmental issues, drilling costs are likely to be high, as successful drilling for shale gas requires sophisticated and expensive horizontal drilling equipment, now readily available in Poland, as well as the associated high-pressure fracking compressors. Given the large number of wells that will need to be drilled per pad and the longer horizontal reach into the shale deposits needed to extract the gas, efficiency time savings will need to be realised to drive well completion time down and reduce the long-term production costs.

#### Connectivity

Construction delays over gaining access permits to well pads and way leaves for pipelines in densely populated European countries will inevitably raise costs and affect the timing of projected revenue cash flows, especially as many countries differ from the US in their degree of interconnectivity to a gas processing and distribution network.

*Environmental impact*

In addition to meeting the initial site environmental requirements, cash flows must consider the expenditure of abandonment and returning the site to its original state after completion of activity, which will involve the safe disposal of the considerable amounts of water and drilling and fracking fluids used during the drilling phase. These severance and remediation costs may be substantial given the large number of individual wells that need to be drilled. The IEA has calculated that to reach the IEA shale gas targets, over one million wells will need to be drilled worldwide by 2035. The IEA calculates that this compares to 700,000 wells drilled in the US in the last 25 years. In addition, during the drilling programme local areas will experience increased levels of vehicular site traffic and noise pollution, for which it would be advisable for nearby communities to be compensated.

**Looking ahead**

The IEA calculates that the US will cease to be an importer of hydrocarbons by 2035. This will be a major boost to its

economy. Should US Congress allow production companies to export shale LNG, this may alleviate the shortage of LNG supplies in the global gas market.

But the real question is whether Europe's indigenous shale deposits can help to reduce its increasing dependency on expensive gas importation. Shale gas could fundamentally alter Europe's security of supply dynamics, but that requires decisive action – the adoption of the IEA's 'Golden Rules', a gas price floor for shale gas, guarantees for timely issuance of drilling permits and credit facilities for shale gas investments. Without such supporting actions, shale gas development in Europe can only occur very slowly, if at all, and will make no real difference to Europe's future energy supply. In that case, natural gas bills will remain high, EU 2020 carbon emission targets will never be met and economic recovery will take longer to achieve. ●

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