Industry Commentary

Shale Gas: North America’s Economic Turbocharger

Can the Phenomenon be Exported?

Abstract

Over the last ten years, shale gas production has emerged as the dominant force in gas supply in the US and Canada, eliminating entirely a perceived need for LNG imports and creating instead a material over-supply fueling both an LNG export boom and a renaissance in the petrochemical sector, heavy engineering and manufacturing. In doing so, shale gas has been responsible for the creation of thousands of jobs, many of which are unrelated to oil and gas production, driving a measurable contribution to the recovery in the US economy in recent years. Furthermore, increases in both shale gas and the related tight oil boom are bringing a degree of energy independence to the US, which could not have been imagined a few years ago. Not surprisingly, many other countries with similar access to tight gas reservoirs are asking themselves whether this is a uniquely North American phenomenon or the start of a wider democratization of natural gas, offering a global vision of low cost, reliable energy for centuries ahead. This article examines the non-technical drivers that have facilitated the success of the shale gas sector, and begins to examine whether these same ingredients can develop sufficiently in the emerging shale gas regions in Europe and elsewhere.

Introduction

When the history books are written about our current decade, one of the major features of the period, whether from an energy perspective, or simply looking at social and economic development, the unprecedented growth in the shale gas sector in the US and Canada will be a highlight. There will be much discussion about horizontal drilling and hydraulic fracturing, but the fundamental feature that many countries outside North America covet at the current time, is the material and sustained fall in the price of natural gas. This has raised the prospect of a long period of relatively low cost energy to drive the economy, through lower electricity prices, a lower cost base for manufacturing, and a renaissance in natural gas-intensive petrochemical and heavy industrial processes.

Shale Gas has become an icon for economic resurgence in the US

However, North America is far from unique in sitting above vast swathes of source rock which, for many years, engineers and geologists have known contain almost unimaginable quantities of hydrocarbons, which, but for an array of reasons, have never before been considered remotely economic to bring to the surface. The estimated global Technically Recoverable Resources (TRR) for shale gas are shown in Figure 1 (on next page).
When looking at the shale gas TTR of the top ten countries in Figure 2, it is China that has the largest shale gas resources at 1,115 Tcf and is currently the most active in trying to replicate the success witnessed in North America.

In asking the question; whether North American success can be replicated in other countries, the starting point is to ask what the key catalysts have been over the last decade, and what lessons can be learned for other jurisdictions. In doing so, this note looks beyond the technological developments and gas infrastructure which are at the heart of shale gas exploitation, and examines some of the other features and circumstances which have come together to facilitate its meteoric rise. It is helpful to look at these from a variety of standpoints:

- Cultural and societal factors
- Sources of finance
- Mineral rights and history of hydrocarbon exploitation
- Regulatory, legislative and political factors
- Environmental considerations

1. Cultural and Societal Factors

With the recent magnifying glass on new and more complex layers of corporate governance and oversight in North America, it is easy to forget that the US and, to a lesser extent, Canadian business culture continues to provide a good framework to reward innovation. Business culture has always been, and continues to be more embracing of risk than many other nations around the world, with an acknowledgement that no safety net can be expected from government or any other source, and failure, together with financial loss, is a real possibility.

The result is a higher proportion of individuals who are prepared to spend time and put their financial assets at risk, with the potential for significant reward in the medium term. Much of the success of the US shale gas growth has been as a result of these smaller groups of individuals, highly vested in the success of their ventures. Big business and major oil and gas companies have then typically entered the fray at the point where commercial success is relatively assured.

In Europe the challenge for governments is to create an environment which will encourage this commercial risk. The UK, through the recent fiscal changes for shale gas development, is beginning to acknowledge the need for a commercial environment that incentivizes developers and their investors to take risk, with sufficient upside to make it worthwhile. This will remain an active debate with those elements in society who are fundamentally opposed to hydrocarbon-based energy policy, as well as the formidable body within the political world and electorate in the UK and elsewhere who believe energy providers are already rewarded too well.

2. Sources of Finance

Another group very closely associated with the success of shale gas, who have enjoyed a symbiotic relationship with the individuals and management teams supplying the vision and drive described above, is the private equity (PE) financiers. They have demonstrated a willingness to bankroll the land costs, exploratory drilling and completion programs needed to prove up some of these emerging gas plays. Usually coming in with a minimum price tag of around US$100 million or more, demonstrating commercial promise in a new shale play does not come cheap. Unlike other conventional environments, whether on or offshore, shale plays need a statistical database to provide a guide to economics, so a few hundred acres of leased land, and
drilling at least 10-15 wells (typically doing completions only at the end of the drilling program) means that it’s an all or nothing commitment. PE finance is one of the most disciplined regimes in the world, and a ruthless process involving checking back for success before releasing each tranche of funds is the driving principle to capping sunk cost quickly and firmly where success is proving tough. Long term partnerships arose out of those early days, with PE finding success with particular management teams, and developing a model they were able to replicate in many of the unconventional plays that are now so familiar.

With this type of high risk/high return opportunity now becoming a rarer commodity in North America, PE financiers could start to turn their attention to setting up similar entities to support unconventional opportunities overseas. However, being able to monetize their investment quickly (typically within about 3 years), equitable taxation terms, and being at liberty to repatriate funds will all be uppermost in their minds. Furthermore, matching local finance from local providers will need to be reconciled with the same outcomes their American counterparts had to live with – i.e. the real possibility that their entire financial stake in a project comes to nothing. In Europe, if the right environment is created similar access to PE finance should be available.

3. Mineral Rights and History of Hydrocarbon Exploitation

One aspect of US oil and gas exploitation which is rarely seen elsewhere is the concept that surface rights and mineral rights usually sit together. In other words, if you happen to own a farm beneath which there is a substantial gas deposit, then you are within your rights to negotiate directly with any oil or gas company who is interested in drilling and subsequent production. However, this is not the case in Canada where mineral rights typically reside with the Crown, and the fiscal regime is usually Royalty-based, with landowners (to the extent the region concerned is of an urban or agricultural nature) compensated only for the disruption created by drilling/completion operations and a relatively small rent paid for the resulting wellhead/pipeline easements required.

The big impact of this has, of course, been in the degree of acceptance for shale gas operations, at least in non-urban areas, especially the vast tracts of agricultural and ranching country in the US Northeast and Southwest. In states like Pennsylvania, where the decline in the agricultural sector in the US has created some of the most economically-depressed areas of the country, being able to monetize mineral rights has been transformational. It has not only made a difference to individuals, but has also fed into wider economic regeneration, resulting in an unprecedented alignment between residents and oil and gas companies operating in their neighbourhood, both seeking rapid delivery of gas to market in as high a volume as can be achieved. It has to be noted that this initial alignment has not always endured, but in general this coming together of landowner and producer interest has been a major catalyst for development. Whilst this mechanism undoubtedly drives economic growth that ultimately benefits a whole region, the somewhat random allocation of substantial personal wealth based largely on an accident of geology (for example, making one farm worth perhaps tens of millions of dollars and another a few miles away almost worthless) is not one that would be acceptable in many cultures. Pennsylvania has taken steps to even out community benefits from shale, with the introduction of an Impact Fee paid for out of gas revenues, which raised around US$200 million for local re-investment in 2013.

The approach in Canada has largely been driven by fiscal arrangements, with novel Royalty mechanisms put in place in British Columbia (BC), which is similarly pro-development. Most of the activity is in regions with little or no population, where incentivisation of landowners is not strictly speaking the deciding factor. However, in BC appropriate arrangements with First Nations tribes are a key to success, based on a partnership that has evolved over a hundred years of oil and gas exploitation. The emerging UK approach to local financial benefits resulting from shale gas development, provided both through a levy on each well to fund local projects and recent changes in how the business rate revenues are dealt with, are beginning to address some of these factors. However, achieving an appropriate industry/community alignment without the track record that exists in North America, suggests reaching a suitable compromise is likely to take time.

4. Regulatory, Legislative and Political Factors

It is no accident that the US shale gas revolution has been focused in areas where oil and gas production has been historically important, given that the majority of it is centred around source rock that has fueled much of the conventional production of the last century. Pennsylvania is perhaps the best example, representing the birthplace of the US oil industry, but where only a few years ago, the incumbent regulators thought they would be “turning the lights out” on a production cycle that was nearing its end. While the regulatory regime in Pennsylvania, and other places, turned out to be inadequate for the challenges presented by shale gas operations, notably in respect of produced water treatment, there was a set of rules and regulations in place concerning permitting, health and safety, record keeping and monitoring, which was the result of decades of due process. In Canada, too,
Shale Gas: North America’s Economic Turbocharger

the Provinces of Alberta and British Columbia (the focus of much of the shale gas activity) operated a tried and tested regulatory regime, albeit requiring periodic adjustment and sometimes major rethinks to deal with the needs of unconventional resource development.

On a political level, although there has been some active debate, the economic benefits of shale gas operations and the level of capital investment and job creation has created a receptive climate for political and legislative support in those jurisdictions affected. The political system that operates in both the US and Canada, results in the majority of policy, legislation and regulation imposed at a State or Provincial level, with Federal government providing (so far) limited control. This has also been a major contributing factor in facilitating shale gas operations in those areas most affected by both the impositions and benefits concerned.

By contrast, energy policy in most countries, including Europe, South America, and most of Asia, is set by central government. Conversely, permitting of wells and, above all, planning permission in most western democracies is a local prerogative, which is fiercely defended. This lack of alignment is a fundamental disadvantage in achieving clear policy for shale gas development, and one that seems likely to require a change in approach, potentially following the “Eminent Domain” methodology adopted in the US for projects that are deemed in the national interest.

5. Environmental Considerations

It would be impossible to deal with an assessment of shale gas without addressing the environmental features, which have emerged as a major consideration both in Europe and some parts of North America. However, when considering that over one million wells have been fracced over the last five decades or so in North America, it has surprised some observers that this has only now become a concern. While in Europe, satisfying environmental concern is paramount to any success.

Many commentators would point to some of the early shale gas operations in Pennsylvania as a major factor for the concern, caused from a combination of inexperienced operators and outdated regulation on produced water disposal, which was not “fit for purpose” when considering the scale of development. Coupled with what some would see as a slow response from the industry to address these concerns, the impact of shale gas operations on the environment, and specifically the watercourse, will remain uppermost in public concerns. However, with the very substantial commercial drivers these days for water recycling, and preventing gas migration from the wellbore, there is arguably a growing alignment of environmental and commercial goals in the US and Canada, which will help to balance the economic benefits of shale gas and the need for sustainable and environmentally acceptable energy policy. Furthermore, recent analysis by Alan Krupnick and Juha Siikamaki of ‘Resources for the Future’ Center for Energy Economics and Policy showed that, while many Pennsylvania and Texas residents are very concerned about the environmental risks of shale gas development, a similar proportion are supportive of the sector. This is highlighted in the survey results shown in Figure 3 and Figure 4.

If the relatively strong environmental track record that the US/ Canadian shale gas sector has achieved over the last two years or so can be continued and even improved upon, plus no additional negative findings emerge, then this would undoubtedly provide the rest of the world with the strong leadership that will be necessary to dissipate the mistrust and concern that continues to be widespread in many countries. This, together with appropriate and well managed local environmental regulations, may prove to be a catalyst for development, and may also alleviate some of the planning concerns referred to above.
Shale Gas: North America’s Economic Turbocharger

Conclusions

Much of the discussion around the exportability of shale gas has focused on the technology and the supply chain, both of which are pre-requisites to successful exploitation of shale gas resources outside North America. However, there are many ingredients to the success of the sector in the US and Canada which are also key considerations, including the presence of an economic and policy environment that rewards innovation and risk taking, and a financing sector that is geared toward high risk/high return projects, with the discipline and processes to minimize write-downs and channel additional funds to build on a track record of success.

There is no doubt that particularly in populated areas, the US mineral rights approach, with landowners highly incentivized through financial alignment with oil and gas companies drilling on their land, has made a major difference to the speed with which development has taken place. In spite of some initial setbacks, notably in Pennsylvania, the long history of oil and gas regulation and environmental controls in the US and Canada has enabled speedy and effective adjustment of regulatory and legislative oversight measures, without creating major delays. Clearly this remains a major concern in other jurisdictions, especially in Europe.

Many of these factors are starting to be recognized outside North America, and if the US and Canada continue down the path of shale gas exploitation, with both economic success and an exemplary record of environmental controls and minimal impact, it seems highly likely that some degree of success can be achieved elsewhere – the main unknown being whether this success is measured in decades or generations.

Authors:
Nicholas Fulford, Global Head of Gas and LNG (nick.fulford@gaffney-cline.com)
Colin Harrison, Principal Consultant—Midstream and Downstream Oil and Gas (colin.harrison@gaffney-cline.com)

Source: Alan Krupnick and Juha Siikamaki, ‘Resources for the Future’ Center for Energy Economics and Policy