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Shale Feedstock Series 2015

Surviving 2015: shale in the spotlight

Since our last article appeared in Hydrocarbon Engineering's Shale Feedstock series a year ago, quite some changes have occurred in the energy sector. Affected most notably by the vast drop in the oil price during the second half of 2014, the shale industry has been forced to face a number of critical challenges which could threaten its future success. Ranging from the continued need for high capital spending to the slight respite awarded European refiners by the availability of cheaper feedstock this article examines the many factors involved in those challenges and what can be done to mitigate them.

Conditions for a crash

While many blamed the Organization of Petroleum Exporting Countries (OPEC) and in particular, Saudi Arabia, for the crash that sent Brent crude prices plummeting from \$114 /bbl in July 2014 to below \$50 in January 2015, two other key factors predating OPEC's refusal to cut production had combined to create the conditions for major change.

First, forecasts for China's oil demand had been unrealistically inflated based on the assumption that, in spite of a well-publicised slowdown in economic growth, demand for oil would continue to grow. In fact, that slowdown combined with a surge in the country's own refining industry contributed to the disintegration of growth in demand for oil products in China to the slowest growth rate since 2000, according to a report by ICIS. If we add to that the gradual contraction in demand for fuel in Europe due to economic weakness, we can see an overall decrease in demand for oil worldwide.

Second, the consistent production from new shale plays in North America and Canada resulted in a large increase in world-wide crude oil supply. According to the Energy Information Administration (EIA), the growth in production from key U.S. shale plays – Bakken, Eagle Ford and Permian – was expected to grow by 103,000 bbl/day in January 2015. Combined with OPEC's unwillingness to cut its own production, a drastic drop in the price of oil was perhaps not too surprising.

That said, Saudi Arabia's production policy certainly had a lot to answer for. As the price of a barrel of Brent crude dropped further in early 2015 to below \$50, pressure mounted from both within and beyond OPEC's borders to relent and stop stoking competitive forces against the "Shalemen" of North America. Accused of deliberately depressing the oil price to a point at which many shale investments would no longer be profitable, Saudi Arabia's defence of its policy is said to be an attempt to right tactical mistakes made during the early 1980s. Having borne the brunt of production cuts when the oil price collapsed to below \$10 in 1986 while others continued production, the ensuing price recovery meant that Saudi Arabia had effectively lost market share. Faced once again with aggressive production abroad, the Kingdom seems determined not to let that happen again.

Effect on the shale fields

The primary effect of the current oil price tumble has been a requisite plunge in the share prices of key shale play holders. Chevron's share price dropped \$20 in the



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first two weeks of December while BP dropped to an all-year low of just over \$34 in the same period, wiping billions off its value along with a number of other energy majors. Service companies are also expecting tough times ahead: Weir Group, which provides upstream and mining equipment to many operators in the shale fields and Wood Group, which supplies pipelines, systems and engineering to the same sector, are expecting large cuts in spending across the United States.

Companies supplying production companies in Russia are also feeling the pinch. Already restricted by sanctions imposed by the United States and the EU following Russia's annexing of Ukraine, service providers are suffering further from the effects of the oil glut. As oil and gas account for approximately half of Russia's budget, the drop in the oil price has caused a crash in the value of the Rouble against the Dollar, further challenging already delicate partnerships in the region. The Bazhenov field located in the West Siberian basin – reckoned by the U.S. Energy Information Administration to contain 75bn barrels of technically recoverable shale, the largest in the world – is therefore unlikely to see any meaningful investment until the Rouble recovers substantially.

While a decline in investment will likely contribute to lower production, the end of shale investment is not necessarily on the horizon. In the short-term, those shale producers who are financed by a high level of debt and cannot withstand the low prices could indeed go out of business, but the larger and perhaps better financed projects should survive. Even if projects are put on ice at the moment, any reduction in the amount of oil available on the market will have the obvious result of supporting a price increase in the long term, bringing profitability back to a comfortable level.

Additionally, huge advances have been made in fracking technology – where a mixture of water, chemicals and sand is shot at high pressure into rock to separate it – so that the time and costs of drilling new wells and extracting more oil from existing ones have both declined. This has reduced operating costs enough that the oil price needed to make a profit has also gone down, relieving some of the pressure. The current constriction of financial resources may also force more effective innovation in the way in which shale is extracted and processed, further benefitting the industry in the future.

Short-term respite for Europe

The effect that these changes have in turn had on the feedstock used in refineries both in the United States and in Europe has also been significant. While more than 50% of global ethylene – used to make polyethylene for plastic manufacturing – is created from naphtha cracking, the trend over recent years has been a widespread decrease in the margins of refiners cracking naphtha compared to those enjoyed by the ethane crackers.

Due primarily to the wide availability of ethane generated from domestically processed shale, American refiners have been able to buy cheap feedstock at home while also benefitting from the higher percentage of ethylene produced when cracking ethane. Combined with the fact that chemical prices tend to follow Brent and WTI crude prices (and not Henry Hub), the refiners of the U.S. have enjoyed quite some advantage from buying feedstock cheaply and selling products at a high price. By comparison, as European infrastructure has typically been built around naphtha cracking refiners in Europe were squeezed both by increased competition from abroad and higher feedstock prices.

Considering the recent plummeting of Brent and WTI crude however, the cost of naphtha has also gone down significantly, offering some cost respite for the naphtha crackers. While it should be noted that chemical prices tend to follow the oil price and therefore buyers have more power to dictate lower chemical prices when the oil price falls, the cost advantage of cracking ethane has nevertheless been cut back and with it, the competitive advantage previously enjoyed by the ethane crackers. Whether this respite is meaningful in the long-term remains to be seen.

Cost saving regardless

In light of such dramatic investment cuts in the market and because there is essentially very little that individual companies can do to control them, the focus from Boards across the industry must be on what can be controlled: fixed costs. Squeezing every single dollar out of their cost structure must be the priority and cost saving initiatives must reach all of the big levers such as contracted costs, labour productivity and material spend, all of which are directly implicated by the shale boom. Managers must look hard at their operating practices and question existing assumptions about effectiveness and efficiency in terms of maintenance,

shutdowns and capital expenditure which together can impact efficiency by as much as 25%. Even if capital investment dries up for a while, the downward pressure on costs should not.

If Saudi Arabia keeps production up and the more vulnerable shale wells stop drilling now, there is no reason why they cannot be reactivated in the future. Equally, those who stay ahead of technological developments and remain prudent with regard to production, operations and expenditure will survive and will be well-placed to take advantage of weaker plays looking for a quick sale. While the Saudis may appear stronger in the short-term, the tenacity of the American investors should not be underestimated: this is a plot with more twists to come.