Shale Gas & Tight Oil: Products & Services

US Industry Study with Forecasts for 2017 & 2022

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**US demand to rise 3.5% annually through 2017**

Demand for products and services related to the development of shale gas and tight oil resources in the US is forecast to rise 3.5 percent annually to $97.9 billion in 2017. Growth in tight oil applications will continue to be strong, supported by high oil prices and the development of newer liquids-rich plays. In addition, the outlook for dry gas plays is expected to improve as natural gas prices increase, especially after 2017. Overall, the focus of activity will shift toward maximizing output from maturing plays (e.g., Bakken and Marcellus), although drilling and completions will continue to be supported by growth in newer formations such as Eagle Ford, Niobrara, and Utica. Other emerging plays like the Tuscaloosa and Wolfcamp will provide strong upward momentum, and in the longer term there is still significant potential in more challenging plays such as the Monterey.

**Growth for all products will be favorable**

Due to sustained high levels of activity, growth for all products will be favorable. The fastest gains are expected for products that help in optimization efforts or are used in maximizing the performance of existing wells. In addition, operators continue to focus on improving their environmental image, which will spur growth in products like closed loop drilling systems and water-based drilling muds. Products such as guar gum gelling agents and services like pressure pumping that saw price spikes due to availability shortages will register slow (or no) growth in market value as competition increases and prices return to more sustainable levels.

**Permian basin to remain largest play, Eagle Ford to grow the fastest**

In 2012, the Permian Basin was the largest market for shale products and services. Through 2017, the Permian Basin will remain the largest play, although sales in the Eagle Ford Shale are expected to advance at the fastest pace of any of the major plays during that time. In the short term, sales will continue to be the weakest in the Barnett and Fayetteville shales, which are mature and more dependent on gas prices for growth. However, in the longer term natural gas prices are expected to rise to the point where growth in shale gas activity accelerates in most gas dominant plays. Nevertheless, moving forward, the greatest opportunity for sales gains will be in developing plays like the Wolfcamp, Niobrara, and Utica, which are all forecast to experience considerable activity as operators become more familiar with their geologies and begin commercial production.
Pressure Pumping Services

Pressure pumping services include hydraulic fracturing, cementing, and other services such as acidizing and nitrogen pumping. These services are used for the completion of new wells and the remediation of existing wells. Hydraulic fracturing services, which dominate pressure pumping demand in shale gas and tight oil plays, typically employ several million gallons of hydraulic fracturing fluid that must be discharged into the well using numerous high power pumps, often a dozen or more. Water, usually the main component of fracturing fluid, must be hauled to the site by fleets of semi trucks. Due to the scale of hydraulic fracturing for an unconventional well in a major play like the Marcellus, pressure pumping services represent one of the most significant costs for well operators.

Demand for pressure pumping services in shale gas and tight oil applications is projected to grow 2.9 percent annually to $39.6 billion in 2017, supported by the continued development of new unconventional plays and the importance of well stimulation activities like fracturing in the optimization of well output. However, this growth will slow considerably from the frenzied pace set between 2007 and 2012 for a number of reasons. Growth in the number of wells drilled and completed is expected to slow to more sustainable levels now that there are a number of established plays in operation. In addition, service companies are becoming more efficient due to improved equipment and better engineered program designs, meaning that fracturing jobs will require less time and fewer fracturing crews. In the short term, an emphasis on liquids-rich plays will reduce horsepower requirements as oil wells in general require less effort than deeper, more challenging natural gas wells. Finally, the pressure pumping industry has become more competitive, with a number of new industry participants entering the market.
Sample Profile, Table & Forecast

COMPANY PROFILES

Ashland Incorporated
50 East RiverCenter Boulevard
Covington, KY 41012
859-815-3333
http://www.ashland.com

Revenues:
North American Revenues: approximately $4.1 billion (FY 2013)
Employment:
15,000 (FY 2013)
Key Products:
cellulose- and guar-based, and synthetic polymers

Ashland Incorporated is a leading global specialty chemical company. The Company operates through four segments: Ashland Water Technologies, Ashland Specialty Ingredients, Ashland Performance Materials, and Ashland Consumer Markets. In July 2013, the Company announced plans to divest the Ashland Water Technologies segment.

The Company is active in the US shale oil and gas industry via the Ashland Specialty Ingredients segment, which generated FY 2013 revenues of $2.6 billion. The segment operates through five divisions, of which the Energy Specialties division makes products for the oil and gas industries. Among the division’s products are a range of cellulose- and guar-based, and synthetic polymers used in drilling fluids, oil well cement slurries, fracturing fluids, completion and workover fluids, and production chemicals.

Ashland’s cellulose-based polymers include AQUAFLO, AQUAPAC, and NATROSOL types. AQUAFLO standard polyanionic cellulose polymers can be used as filtration control additives and fluid rheology modifiers in drilling fluids, while AQUAPAC premium poly-anionic cellulose polymers are designed to inhibit shale swelling and

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TABLE VI-16
EASTERN REGION: SHALE PRODUCTS & SERVICES DEMAND (million dollars)

<table>
<thead>
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<th>Item</th>
<th>2007</th>
<th>2012</th>
<th>2017</th>
<th>2022</th>
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<td>Drilling Products</td>
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<td>Other</td>
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This Freedonia study, *Shale Gas & Tight Oil: Products & Services*, offers historical data (2007, 2012) plus forecasts for 2017 and 2022 for demand by product, service, region and play. The study also examines market environment factors, analyzes key competitive variables, evaluates company market share and profiles 47 competitors in the US industry.
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