Growth from "Tight" Places

by John D. Jacquin,
Chemark Consulting

(Part 1 of a 2-Part series)

Over 460 million years ago the first jawless fish swam in shallow seas of what was to become the Appalachian basin of North America. Over the next several million years, the central portions of the North American plate teemed with evolving life below shallow seas and eventually flourished in coastal forests, subject to inundation by fluctuating ocean level. The process of burying organic material, devoid of oxygen and under great sedimentary pressure continued through Cretaceous era, the last age of the dinosaurs, ending 65 million years ago. This long-term evolutionary process has produced the natural energy sources of the industrial age . . . oil and gas reserves.

Growth & Sustainable Profitability

The theme of last month's Business Corner was growth and sustainable profitability. Two important elements required to achieve growth are developing new markets and leveraging loyalty to capitalize on the opportunities. True loyalty affects profitable growth, both directly and indirectly. In a direct sense, customer facing engagement resources can accurately measure true loyalty, and provide the supplier with opportunity to gain new business as the customer grows. However, when market resources are "downsized" to manage short term goals, it lessens inter-company communication and thereby the relationship. This will negatively impact loyalty as well as performance, especially critical during periods of change, either planned, as when introducing a new product or business merger, or even an unplanned and unforeseen quality problem, during a consolidation.

Yet indirectly, "intense loyalty" reaches deeply into the growth cycle, by exposing the value chain to new opportunities. A loyal customer will invite a trustworthy supplier to understand, participate, and contribute value to help develop a new market – a growth area that the supplier might have little knowledge of without the connection of a loyal relationship. Developing new markets is a key to sustaining profitability, and loyalty fuels the opportunity access. So loyalty is the "bridge" we all must build as the basis for sustainable profitable growth.

Growth in Today's Economy

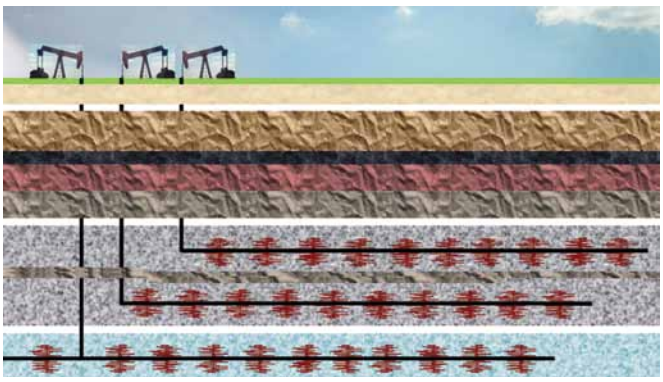
Where can we find "fuel" for sustainable growth in today's economy? Consider the past . . . That buried organic debris was compressed under shale and limestone into the resources that fuel our modern world. The Appalachian basin contains two layers of buried energy – Utica shale from the middle Ordovician period and Marcellus shale from Devonian yield gas from Pennsylvanian and surrounding area wells. The Bakken formation, centered in western North Dakota, yields light oils extracted from within shale deposited in late Devonian and early Mississippian times.

The early Mississippian era also yields gas and light oils from Barnett shale in North Texas. Further south, oil and gas is extracted from Eagle Ford shale deposits originating from Cretaceous life. Growth from TIGHT Places . . . "Tight gas and tight oil" (a light crude petroleum product) are extracted from formations of low permeability, such as shale. The common element of these shale formations is that until recently, it was difficult to economically extract the gas and oil from these reservoirs.

The Influence of Hydraulic Fractionating

Over the last decade, the process of hydraulic fractionating (fracking) and horizontal drilling (figure 1) has been perfected in North America, recovering formerly unattainable reserves of crude oil and natural gas. The growth in known reserves and substantial increase in petroleum production levels in the U.S.

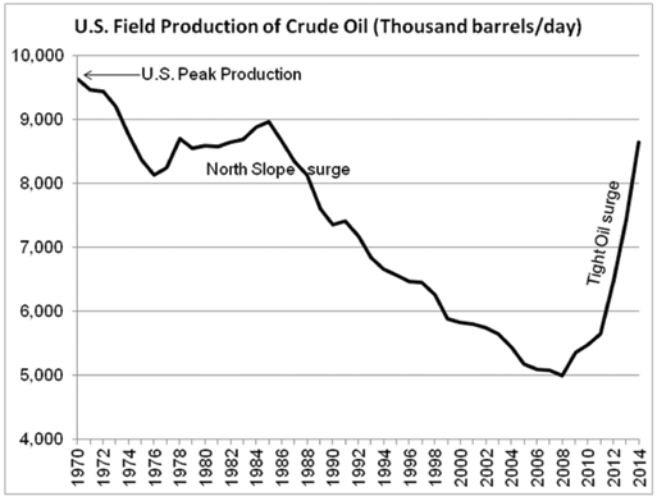
Schematic of Shale Field
Hydraulic Fracturing (Fracking)
& Horizontal Drilling



Three well bores with lateral drilling (one dual) and multiple fracking zones along the horizontal bore are diagramed. Small fractures are created with controlled explosive charges and an injection fluid (water mixed with sand and chemicals) is forced into the formation under pressure to further fracture the shale and extend the reach of the well. Extracted tight gas or oil is conducted through the low porosity shale formations of the fracture stations. Hydraulic fracturing is estimated to have increased U.S. oil reserves by 50% and gas reserves by 90%.

has created a world changing event. This new-found economic energy and raw material source translates into new opportunities for coating manufacturers and suppliers of resins, additives and specialty polymers to achieve sustainable growth.

What kind of growth are we talking about? Consider this: The U.S. Energy Information Administration estimates that more than half of the domestic natural gas and close to half of the crude oil produced is shale gas and tight oil. U.S. production of crude oil in 2014 has nearly doubled since 2007 and is close to the highs of the mid-80s after Alaskan North Slope production came on-stream (figure 2). Some forecasts project that within a of couple years U.S. petroleum production will surpass the record years of the early 70s. Natural gas withdrawals are at an all-time high and growing yearly; production is now 30 percent above the turn of the century average. In 2013 the U.S. became the number one producer of natural gas in the world; and the number one global producer of crude oil. These achievements would not be possible without the extraction of tight gas and oil through fracking.



Source: www.eia.gov

Global Energy Economics

Although crude oil market prices have dropped from $100/bbl to $40-60/bbl, U.S. production is expected to not only be sustainable but grow over the next half dozen or more years. The price reduction is attributed to several causes: (1) an excess in supply driven by an increase in U.S. shale based tight oil production, which grew from 0.6 mbbl/day in 2008 to 4.7 mbbl/day in 2014 (2) growing and even record crude inventory levels due to increased production and sluggish growth at many of global economic leaders and (3) geo-political efforts to curb the tight oil production in the U.S. through lower pricing. As expected, the number of shale drilling rigs decreased significantly during the early part of 2015, potentially knocking a couple percentage points off the growth curve.

However, the cost of refining crude oil is more complex than the extraction process. Geopolitics, especially where oil profits are funding government programs, tend to require higher pricing; and crude oil transportation, over land or sea, can play a huge role in cost. In spite of the constant U.S. Congressional/Executive wrangling over projects like the Keystone pipeline or ANWR, and local (state or county) bans on fracking operations, the U.S. (and Canada) are very stable politically and exert relatively, minimal impact on exploration and drilling.

The more critical cost factor in North America is transportation of the new tight oil, specifically the lack of available pipelines and the need to use rail to convey the crude to the refinery. For example, North Dakota, now the second largest petroleum producing state, in not nearly as well connected by pipeline to the refineries on the gulf coast (or elsewhere) as the oil fields in Texas, still the number one producing state. Some estimates on the break even point for tight oil fields are below $40/bbl; other sources indicate that tight oil is competitive with other high-price resources at $50-80/bbl.

Whatever the break even cost may be, the hydraulic fracturing process has significant potential for cost reduction, and as pipelines connect shale gas and oil fields, transportation will become less costly versus shipment by rail car. (It may also become safer, given some of the recent crude oil train wrecks in Quebec, West Virginia and Illinois).

These developments will continue to lower tight gas and oil cost and further drive down break even costs. Further, tight oil fracking operations are very flexible. Drilling rigs can be shuttered or redeployed quickly – in a matter of weeks or months – when crude prices decrease or recover; and they pump at a greater rate than conventional drilling wells. Thus, the flexibility of tight oil production, now over 6 percent of the global output, may have significantly diminished the influence of OPEC to set prices, especially ceiling prices, and may exert a stabilizing effect on pricing at levels significantly below $100/bbl.

Impact of Fracking on coatings and its associated value chain

There is no doubt that tight oil and gas production is expected to grow for many years to come. So how does that impact the market for coatings and the polymers, resins and additives used to formulate them?

We need to review the typical hydro-fracturing operational system and from this we can understand where growth can be generated. For example, the equipment used to build the site, access and store the raw materials, extract and store the resource and transport it to market are all potential areas of sustainable growth. Conventional coatings are required in every aspect of this process, and the fracking process itself uses new technologies that employ specialty coatings and polymer systems that represent new markets for the industry. Being close to this industry and having rapport and built in loyalty can help coating suppliers both participate as well as support these growth opportunities.

Next month, part 2 of this article will describe the fracking process and explore specific areas where coatings are expected to grow and what new technologies are required to extract oil and gas from tight places. ***CW***