Shale Supply Intel ®

Insights for Suppliers of Construction, Equipment, Materials, Supplies, Services, Logistics and Technology to Energy Operations

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Crude oil from shale:
SUPPLIERS GET READY - recovery is coming

Although the market remains weak today for suppliers of equipment, construction, services and supplies to US crude oil production from shale, **the medium-term future looks bright**. Supply chain participants should stay close to market trends and be ready to capitalize when the upturn starts. **While production will continue to decline in the near term, there is potential for a substantial swing to the positive over the next 18 months. Here's why:**

- According to the International Energy Agency (IEA), the global excess of crude oil supply versus demand grew to 2 million barrels per day (mmbpd) in 2015. That imbalance has been the root cause of the price collapse. **Because of falling production and rising demand, the excess of supply is expected to shrink to 1 mmbpd in 2016; then supply and demand come into balance in 2017**.

- Global demand for crude oil is projected to continue to grow by 1 to 1.5 mmbpd each year into the 2020s. By 2020, demand will exceed supply by about 1 mmbpd.

- According to Wood Mackenzie, over **$500 billion of investment in global crude oil production capacity that had been planned for 2014 through 2020 has been cancelled or deferred**. Production capacity lost from cancelled projects will total nearly 3 million barrels per day over the long term. Since many are "mega-projects" that require multi-billion dollar investment and several years to bring online, **it will take years to get them financed, built and producing, once they are green-lighted**.

- The U.S Energy Information Administration reports that OPEC collectively has very limited (about 1.5 mmbpd) spare capacity to ramp up production. Russia essentially has none.

- **That leaves US shale as the only major crude oil production source in the world that can be ramped up quickly and in substantial quantity**. Therefore it stands to gain the lion's share of production needed to fill the growing gap created by the combination of conventional production declines (exacerbated by reduced investment) and demand growth.

- **Given these economics, IEA estimates US crude oil production will grow from under 9 mmbpd in 2016 to over 14 mmbpd by 2021**. Why 5 mmbpd US production growth when global demand is only 1 mmbpd more than supply? Because of the decline in non-US production coupled with non-replacement from the cancelled new projects.

- Here's the punch line: with just under half of current US crude production now coming from shale, the implication is that **shale production will need to as much as double over the next five years to account for that 5 mmbpd US growth forecast by the IEA**.

- That's a lot of new horizontal shale wells - **and therefore a tremendous amount of equipment, construction, cement, steel, sand, supplies, services, logistics and everything else needed from the supply chain to support the production**.

- We must point out for good measure that **little of that future US production growth would become possible without the ability to export American crude oil**; had not EEIA and the major producer organizations mounted a massive and ultimately successful advocacy campaign last year to lift the export ban.

- More good news: producers and oilfield service companies have realized major cost efficiencies and production productivity improvements during the downturn (although sometimes at the expense of their suppliers), and can therefore restart profitable production at lower crude price levels. **Chevron recently announced that in the Permian Basin of West Texas, they have 1,300 profitable drilling locations at $40 per barrel; 4,000 profitable at $50; and 5,500 profitable at $60**.

- According to IHS, the average US well drilled in 1Q16 will achieve productivity that is roughly 20% higher than a well in 4Q14. Meanwhile, costs have fallen by about 40%. Therefore producers achieve 120% of the output at 60% of the cost, **doubling the production efficiency of capital since the market decline began in late 2014**.

Here are some potentially limiting factors:

- **Record oil inventories**. The US has 535 million barrels in storage; globally inventories exceed 1 billion barrels. Some of this will fill demand initially in lieu of new production. Keep a close eye on American Petroleum Institute and U.S Energy Information Administration weekly storage inventory reports for clues. **Once inventories show sustained declines, the turnaround is closer**.

- **"Drilled but uncompleted" (DUC) shale wells**. There are an estimated 3,000 in inventory spread around all US shale plays (some estimates are higher). **These could provide an immediate production surge because of the significantly lower incremental additional cost to bring them online**. Estimates of the additional production possible from these wells within a relatively short timeframe vary in the 200,000 mmbpd range.

A limiting factor to rapid DUC completions is the fact that completion crews and equipment fleets have been severly reduced by the crash. While drilling-driven supply chain activity won't benefit from completing DUCs, **demand remains for completion needs such as sand, chemicals, water management, and logistics capacity for moving equipment, supplies and fluids to and from the site**.

- **Skilled worker shortages will be acute in the recovery** - among both producers and suppliers. Many energy-driven supply chain jobs have been eliminated and skilled workers have gone on to others careers.

Where will recovery be felt most by suppliers?

- Lots of **deteriorated/cannibalized rigs and equipment now rusting in yards will need to be repaired or replaced**.

- Sand is being used in much larger quantities per well: **an average of 7.5 million pounds (3,750 tons) per well today up from 4 million in 2012**. Producers have found that more sand increases production. **Sand production and transportation, along with the equipment needed to mine and move it, will surge**.

- **Demand will surge for tubular goods, cement, sand, chemicals, tanks, hoses, valves and fittings, and a host of and other component and supplies needed to drill and complete wells**, along with the logistics for moving everything to and from production sites.

- More pipeline transfer of fluids to and from the site - frack water, waste water, and product - will replace truck round trips; for safety, efficiency, traffic reduction and environmental benefit. **This will generate significant construction and supply opportunity**.

- As the recovery takes hold, **producers will expand back to areas where they have not drilled during the contraction**. This will spur additional recovery in categories of supply where efficiencies were gained by producers retrenching to concentrate on "sweet spots".

Risks and wildcards that could affect the timing and pace of recovery:

- **Opposition to oil and gas production is growing**, including "leave it in the ground" politics and anti-fossil fuel sentiment and rhetoric, elevated in the context of national elections. At least one US presidential candidate advocates banning fracking altogether.

- **State-level opposition to production could grow**. The worst case is New York's total fracking ban, but other threats include attempts in Colorado and California to severely limit drilling. Local and municipal fracking ban proposals may well grow again once drilling activity returns in earnest.

- Opposition to construction of pipeline infrastructure is also growing. Those opposing oil and gas figure that stopping pipeline projects will also impair production and consumption.

- **Concerns about the possibility of earthquakes being induced by underground wastewater injection**. There is considerable ongoing scientific research and debate about the causes and risks associated with deep disposal wells - along with a significant amount of industry investment in developing other means of waste disposal.

- **Geopolitical events** - any major interruption to Middle East production would put everything up for grabs, depending on the severity and duration of any production curtailment.

- **Further economic weakness in Asia** - particularly in big consuming countries China and India - could derail global demand growth projections and lengthen the time horizon for supply/demand balance.

Bottom line: With supply chain capacity increasingly focused away from energy over the past 18 months, firms with the ability to marshal the capital, people, fleets and inventories needed to surge their energy business, on relatively short notice, will win big when the rigs start turning again.