2021 | ITE Management

THE IMPACT OF THE FRAC SAND MARKET ON RAIL CARS

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June 2021

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What is “fracking” and how did it impact U.S. Oil production?

“Frac sand” is a critical component in horizontal (or directional) oil and gas well drilling. Horizontal drilling refers to the practice of boring a hole near an oil or gas well and then drilling numerous times horizontally (or “directionally” rather than just once in one direction; vertically). This practice allows drillers to access oil and gas deposits obstructed by surface objects (e.g. rocks, bodies of water, human structures, etc.), in order to tap multiple wells with one downhole drill (saving time and costs), and generally to tap a deposit in the most advantageous manner.

The term “frac” or “fracking” derives from “fracturing”, the practice of fracturing shale deposits to release gas trapped within a formation. Fracturing entails the injection of fluids, “hydraulic fracturing”, together with very small solid material, proppants, that then hold open those cracks, allowing trapped oil and gas to escape and be collected. “Frac sand” is sand used as a proppant in directional shale drilling.

The advent of hydraulic fracturing and directional drilling was nothing short of revolutionary. According to the Energy Information Administration (EIA), horizontal drilling and fracking of shale accounted for fewer than one million barrels of oil a day in the entire U.S. a decade ago. Today, directional drilling in the Permian basin alone pumps roughly four million barrels a day. With the help of hydraulic fracturing and directional drilling, America became a net exporter of refined petroleum products in March of 2011.[1] In February 2018, America became the world largest oil producer,[2] and in September of 2019, America became a net exporter of all oil products, both refined and crude oil, for the first time since records began.[3] Oil extracted from shale formations contributed to the nation’s declining dependence on foreign oil.

Some of the sand most effective for fracking was found in Illinois and Wisconsin[4], quite far from many productive shale formations. Drillers sought to transport the coveted “Northern White” sand from pits in the upper mid-West across the country. Rail’s low cost and high-volume tonnage made it an important transportation mode for Northern White.

[1]Today in Energy, “U.S. petroleum product exports exceeded imports in 2011 for first time in over six decades”, March 7, 2012, EIA

[2] “U.S. Becomes World’s Largest Crude Oil Producer and Department of Energy Authorizes Short Term Natural Gas Exports”, September 13, 2018, U.S. Department of Energy

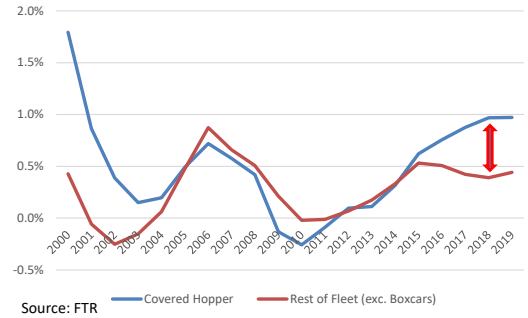
[3] U.S. Energy Facts Explained (https://www.eia.gov/energyexplained/us-energy-facts/imports-and-exports.php)

[4]https://www.researchgate.net/publication/272378346_Methodology_for_assessing_CO2_storage_potential_of_organic-rich_shale_formations

How did fracking impact the North American rail car market?

Production of small-cubed hoppers, rail cars best suited for frac sand (but not exclusively so), rose to meet frac sand shippers' demands. Growth of the North American covered hopper fleet began accelerating in 2014, when the fleet of covered hoppers grew at an increasing compounded annual growth rate of 0.6% up to 1% by 2019, while the rest of the North American fleet (excluding box cars) registered around 0.6% for the same period. (See graph at right.)

Change in Annual North American Railcar Production

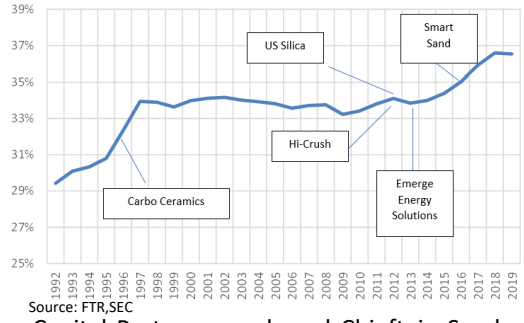


Source: FTR

Shippers of sand tended to be the sand miners themselves and the growth in the sand mining industry grew rapidly. Some of the largest publicly traded frac sand companies undertook initial public offerings (IPOs) from 2012 to 2016. (See graph below and to right.)

According to FTR Transportation Intelligence, from 1999 to 2019, the share of covered hoppers (which includes small-cubed hoppers) grew from 29% of the total North American fleet to almost 37%.

Small Cubed Hoppers as % of North American Fleet & Various IPOS



Source: FTR,SEC

The IPOs that began in 2012 were only the most visible capital flows to frac sand miners and shippers. Behind the scenes, private equity was channeling funds into the space. In 2014, Kohlberg, Kravis, Roberts invested $680 million in Preferred Sands. Ares and First Reserve Capital purchased Vista Proppants and Logistics in 2017. NGP Capital purchased Black Mountain Sand in 2016. CSL Capital Management partnered with High Roller Sand and Lynwood Capital Partners and Energy Capital Partners purchased Chieftain Sand and Proppants in 2012.

The influx of new capital and new entrants not only resulted in increased competition, price pressure and over capacity, it left the industry exposed to a sudden collapse in oil prices. Not all shale formations enjoy the low lifting costs, which can range between $25 and $90 per barrel and half of US shale capacity has a breakeven lifting cost of $40 per barrel.[5] Prices from 2011 to July 2014 justified shale drilling.

In mid-2014, oil prices began declining sharply, exacerbated later in the year by Saudi Arabia's decision not to reduce production at that year's OPEC meeting. Oil prices recovered through 2018, but then fell again when Russia and Saudi Arabia (and other OPEC producers) increased production in response to feared supply contraction after President Donald Trump reinstituted sanctions against Iran, OPEC's third largest producer. In March 2020, Russia announced its break with OPEC's quotas. These sequential increases in supply came just in time for the advent of the COVID pandemic in the United States which saw quarantining begin in mid-March of 2020. The rising

Historic Oil Prices

Source: FRED

[5] S&P Market Intelligence, "Half of producing shale oil wells are profitable at $40/bbl, analyst says", Mark Passwaters, August 21, 2020 https://www.spglobal.com/marketintelligence/en/news-insights/latest-news-headlines/half-of-producing-shale-oil-wells-are-profitable-at-40-bbl-analyst-says-60035427

supply of frac sand from new, and newly capitalized, entrants from 2014 to 2019 weighed on frac sand pricing and dragged down small cube hopper values. Unlike other commodities, whose transportation costs account for a tiny fraction of overall freight value, frac sand transportation costs can be more than 30% of total cost. The coupes-de-grace of OPEC's opened taps and the pandemic's parking of America's automobiles pushed many frac sand suppliers into financial distress. Small cube hopper values responded accordingly.

In short order, many suppliers, including some of those named above, restructured their debt or filed for bankruptcy protection. The oversupply of entrants meant that gate price per ton for Northern White started a secular decline in late 2017, plummeting form $53 in 2017 to $19 in early 2021. Those that survived, shifted their offering from Northern White to an integrated fracking product, consisting of roughly 80% local sand by volume and the remainder Northern White to maintain quality.

Falling frac sand prices hurt both manufacturers and operating lessors. Trinity Industries, one of the largest rail car manufacturers based in the United States wrote down almost $370 million in rail car assets in the first quarter of its fiscal 2020, with Trinity Chief Financial Officer Eric Marchetto claiming that Trinity's frac sand customers faced a "one-two punch". In its first quarter earnings call, Trinity further noted that the sourcing of frac sand has evolved, resulting in structural changes within the frac sand supply chain. Energy prices also experienced a "drastic fall," according to Marchetto, and the energy market faced increased pressure related to the COVID pandemic. As of mid-2020, approximately 55,000 to 60,000 of the 125,000 small cube covered hoppers available industrywide were "underutilized," per Marchetto. "With our outlook for domestic drilling, and specifically Wisconsin white sand being used in the Permian [Basin], we don't think that [market] is going to come back to the degree that it was," Marchetto concluded.

Conclusion

The worst appears to be behind the frac sand industry and certainly for covered hoppers. Lessors have already recognized meaningful losses and any further write-downs are likely to be small. Prospects for frac sand demand and prices, and, by extension, for covered hoppers, likely depend on the price of oil. A resurgence in oil prices could mean demand recovery for frac sand and higher lease rates for covered hoppers. The widespread distress experienced by frac sand miners likely rationalized capacity, catalyzed consolidation and introduced greater discipline among competitors. At the same time, President Joe Biden's infrastructure bill is expected to create demand for cement, soda and fly ash, which will require covered hoppers for transportation, brightening prospects for the North American fleet.