US shale outlook seen at risk from more intensive fracking

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US shale oil production is unlikely to peak before the middle of next decade, but current fracking techniques may be risking the prospect of faster decline rates from tight oil than many are forecasting, a top oil industry event was told this week.

•New techniques may offer short-lived gains
•Shale well productivity rates slipping
•Others more upbeat over late-life declines

As the US shale industry continues to chase lower breakevens and boost productivity in the wake of the 2014 price downturn, shale players have turned to pumping much larger volumes of sand and water into horizontal wells.

In addition to "bigger fracks", drillers have also increased the density of their fracking stages in a bid to boost the volumes of tight oil drained from each well.

Although the techniques have raised initial flows rates by up to 30% in some wells, the intensive fracking is depleting the source rocks faster risking a sharp rise in future decline rates, according to Bernand Duroc-Danner, the former CEO of Weatherford International.

"If you're going to be fracking closer zones like crazy, lots of sand, lots of water, lots of pressure, you drain the hell out of those zones which is why production goes up," Duroc-Danner told the Oil & Money conference in London.

"But then those zones don't get replenished...after two years, there'll be a build up in decline rates...I am not so sure if the battle won't be, in two years, to sustain the base as opposed to keep on growing," he added.

With higher intensity fracking, US shale decline rates are already creeping up in some shale plays, but the impact is overwhelmed by increased drilling activity, Duroc-Danner said.

Energy research group Wood Mackenzie recently flagged similar concerns over the production outlook for the Permian Basin, the world's top shale play.

Citing risks related to tighter well spacing and well-on-well "interference", Wood Mac last month estimated that the Permian could see peak production by 2021, putting more than 1.5 million b/d of future production in doubt.

GAINS CEILING

The Permian, which sprawls across West Texas and Southeast New Mexico, currently produces about 2.735 million b/d of oil, according to Platts Analytics.

Forecasts a year or two ago for roughly 3 million b/d crude oil output for the play by 2020 are now looking at 5 million to 5.5 million b/d in the early-to-mid-2020s -- and even more after that. Wood Mac's central forecast is for Permian output to increase to more than 5 million b/d in 2025.

Although upbeat on the future prospects for the Permian, US shale giant Pioneer Natural Resources is also wary that current efficiency gains from bigger fracks may be hitting a ceiling.

"In the US, we are essentially using a sledgehammer approach. We are using larger volumes or sand and fluids and pumping at higher rates," Pioneer's CEO Tim Dove told the event.

"As some point you reach a peak on logistics, limits on sand, water volumes..that's where we are getting to, (although) we're not quite there as an industry," he added.

Indeed, while technology gains in the past few years have been key in lowering shale costs and boosting well performance, productivity has been been falling of late. Well productivity data from the US' Energy Information Administration shows flows from new wells have been mostly falling since mid-2016. Permian rig productivity will average 572 b/d this month, the EIA predicts, down from more than 729 b/d in August 2016.

Dove said he thinks the productivity data is an unfair measure of future shale production, however, as the current rate is being dragged down by a number of factors.

"What you have here is a portfolio effect, the fact that some of these rigs are attacking zones that may not be as prolific as the core of the core...by definition we'll see averages come down," he said.

Dove said shale well productivity is also being hampered by a shortage of workers returning to the recovering sector and a current tightness in the fracking equipment market due to the uptick in more intensive well completions.

PRICE KEY

But he remains optimistic the productive life of the Permian will extend "far beyond" 2025. Output from the prolific shale play could peak before then, he said, but only if oil prices fail to recover significantly from current levels.

"Clearly until the middle part of the next decade we're going to be growing." he said. "We'll see what happens after that, but its a matter of price...at $60-$70/b all kinds of new portfolio opportunities are presented.

"At some point the number of locations you would drill at $50/b would be minimal, in say 10 years from now, and we might need a higher price to bring in new resources," Dove said.

Pioneer, which is planning to quadruple its current shale-led production to 1 million b/d of oil equivalent by 2026, is the lowest cost US shale producer with cash breakeven's at roughly $20/b, he said.

"{The falling productivity] is certainly not a reflection of anything other than the ramp up." Dove said. "The quality of these [assets] are really phenomenal, no doubt about it."

Dove's more upbeat outlook for the US shale industry was in part supported by comments from energy analyst group Rystad Energy.

Rystad's head of analysis Per Magnus Nysveen said he expects drilling to be active on the shale sweet spots for "quite some time", with drilling the less prolific Bakken lasting another 2-3 years and activity on the best acreage in the Permian to continue for a "very long time."

He said US shale output would "flatten out" sometime between 2020-25, but estimated the sector's decline curve may also be flatter than some are predicting.

"What we have seen in the data is that there is not a terminal decline after 10-15 years," Nysveen said. "The wells seem to stay relatively robust producing 40-50/b when they are getting old."

Without giving further details, he said if late-life declines from shale plays perform to Rystad's modeling, older US shale wells could be pumping at rates much higher than current so-called "stripper wells" which produce less than 10/b.