Could fracking boom peter out sooner than DOE expects?

Wendy Koch, USA TODAY 10:46 a.m. EST November 3, 2013

The future of the U.S. fossil fuel industry rests largely on fracking, which has brought a surge in oil and gas production. Energy experts disagree, though, on how long this boom will last.

Surging oil and gas production is nudging the nation closer to energy independence. But new research suggests the boom could peter out long before the United States reaches this decades-old goal.

Many wells behind the energy gush are quickly losing productivity, and some areas could hit peak levels sooner than the U.S. government expects, according to analyses presented last week at a Geological Society of America meeting in Denver.

"It's a temporary bonanza," says J. David Hughes, an energy expert at the Post Carbon Institute, a research group focused on sustainability. He studied two of the nation's largest shale rock formations, now the source of huge amounts of oil and gas, and said they could start declining as early as 2016 or 2017.

The reason: "sweet spots" — small areas with the highest yields. Hughes says these spots simply don't last long. Unless more wells are drilled, the Bakken shale of North Dakota and Montana loses 44% of its production after a year and the Eagle Ford shale of Texas, 34%. Most of the nation's major shale regions produce both oil and gas.

"You have to keep drilling more and more just to maintain production," says Hughes, adding this can become too costly to be profitable. He notes oil production in the Bakken, which skyrocketed between 2008 and 2012, has already started to slow down and Eagle's Ford may soon follow. The U.S. Energy Information Administration (EIA) projects both shale plays will hit their oil peak in 2020, declining afterward.

Taking a similarly pessimistic view is Charles Hall, professor at the State University of New York, Syracuse and author of *Energy and the Wealth of Nations*. His analysis of Bakken production, now accounting for nearly a third of all U.S. oil from shale, found almost all its oil comes from just a few "sweet spots." He also cited EIA data that show gas production has been falling since mid-2012 in the Barnett of Texas and the Haynesville of Texas and Louisiana.

People hold signs during a rally against hydraulic fracturing for natural gas, or fracking, on Oct. 30, 2013, in Albany, N.Y.(Photo: Mike Groll, AP)

Others see brighter prospects for the U.S. shale boom, which is largely due to the recent combination of horizontal drilling and hydraulic fracturing or fracking. This controversial process extracts copious amounts of gas or oil — known as "tight oil" — from shale rock by blasting it apart with a water mixture, laced with chemicals, that's pumped underground. It has raised environmental concerns, because studies have linked it to potential groundwater contamination, minor earthquakes and other problems.

Fracking has transformed the U.S. energy industry. It's a major reason why the nation's total production of crude oil has increased since 2008, reversing a decline that began in 1986, and lowered petroleum imports from their peak in 2005 when they covered 60% of U.S. consumption. A September report by Colorado-based consulting firm IHS said the shale boom has lowered natural gas prices and created a steadily increasing number of jobs throughout the economy.

The boom will continue for decades, says William Fleckenstein, a petroleum engineering professor at the Colorado School of Mines, which receives funding from the fossil fuel industry. He says major shale regions are performing better than expected. Though well productivity falls quickly after the first year or two, he says the initial gush gives investors a quick payback.

"The technology is going to improve," he says, adding that forecasts based on shale wells drilled even a few years ago won't be accurate. He points to EIA data, released in October, that shows how rig productivity has increased over the last year for new oil wells in the Bakken and Eagle

Ford and for gas wells in the Haynesville and the huge Marcellus shale, which stretches from New York south to West Virginia.

In the Eagle Ford shale, the University of Texas at San Antonio reported in March that fewer wells will be drilled but total production of both oil and gas will rise considerably by 2022.

New shale regions are also emerging. In the Permian Basin of Texas and New Mexico, the production of oil will more than double and that of gas will nearly double by 2025, according to an investor presentation last month by Pioneer Natural Resources, a Texas-based oil and gas company.

How accurate are these projections?

"Tight oil development is still at an early stage, and the outlook is highly uncertain," says the Department of Energy's EIA in its Annual Energy Outlook 2013, adding its future will depend on how individual wells perform as well as their costs and the revenue they generate.

The EIA also says it cannot "fully ascertain" the likely impact of technology advances, because many shale wells using the latest technologies have been operating less than two years.

So there are a lot of caveats in its 30-year forecasts. In the most likely scenario, it expects total production of "tight oil" will continue to rise until 2020, then decline. In contrast, it expects shale gas production to increase 113% by 2040, when it will account for half of all natural gas produced.

Even those who are bullish on shale's prospects say it's not likely to deliver U.S. energy independence, at least anytime soon.

"We won't become energy independent, but we'll become less energy dependent," says Daniel Yergin, IHS vice chairman and author of *The Quest: Energy Security and the Remaking of the Modern World*. He says though petroleum imports have fallen dramatically in recent years, they still account this year for 35% of consumption — the same share as 40 years ago.

Hughes says the shale industry's long-term viability will rest not only on well productivity and market prices but also on its potential damage to the environment. He says rising grass-roots opposition to fracking could thwart its expansion.

As with any energy source, he says shale has economic and environmental costs, adding: "There is no free lunch."