

Chart of the Week #2025-11

Measuring Productivity Improvements in U.S. Shale Oil and Gas Production



MILEPOST - 1458.10
Old M&R 060 Valve Site

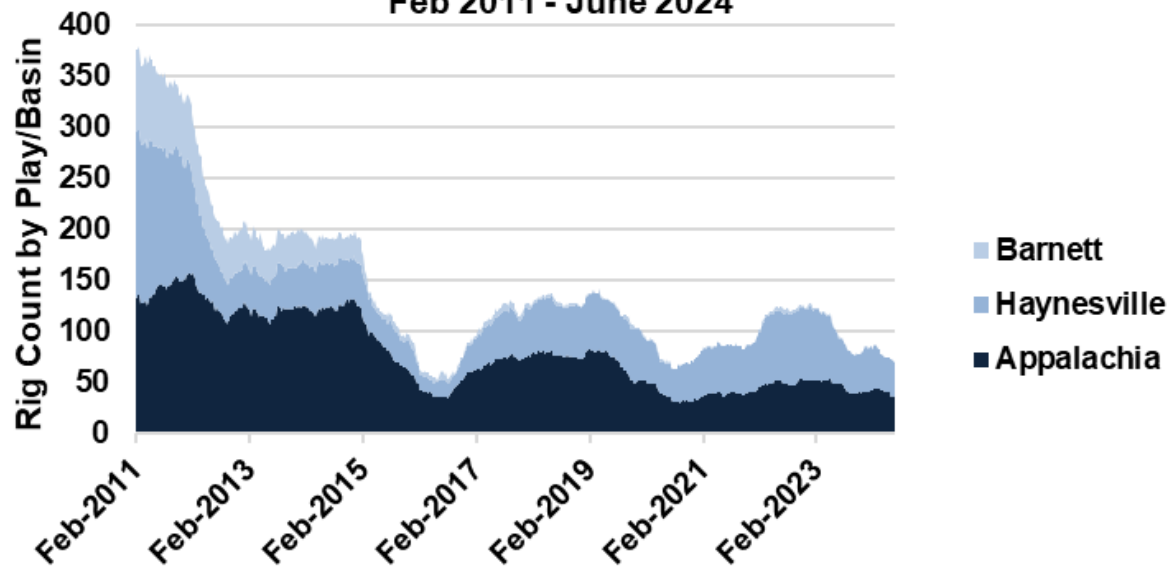
In case of emergency,
call 609-397-0700
or 1-800-231-7794

March 19, 2025
Washington, DC

Productivity Improvements in U.S. Gas Producing Shale Basins

U.S. Rig Counts: Gas Producing Basins

Feb 2011 - June 2024

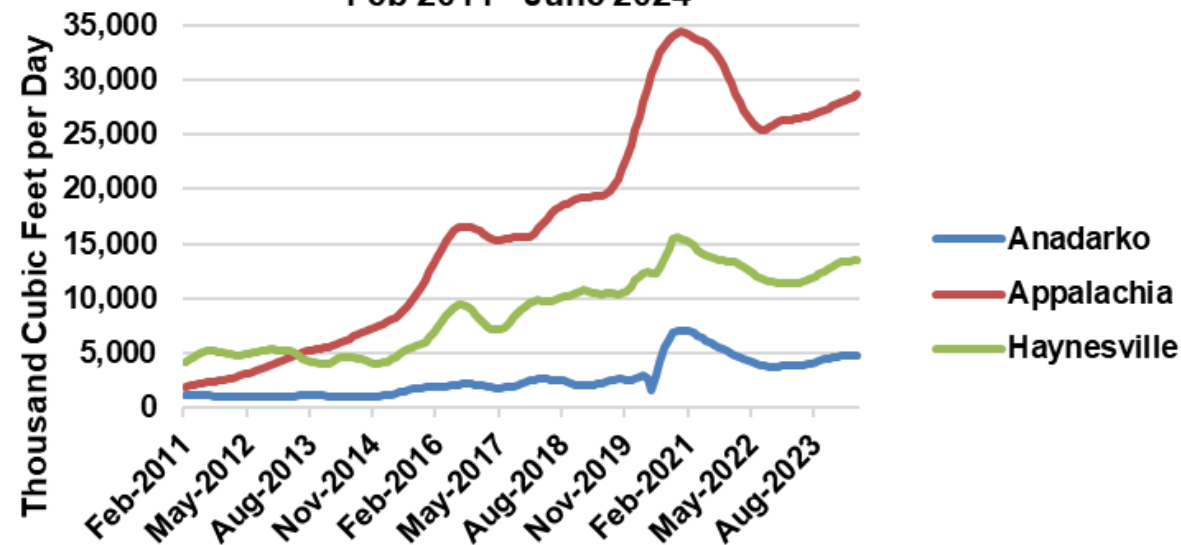


Analysis Based on Weekly Baker-Hughes Data

EPRINC

U.S. Shale Basin Gas Production per Rig

Feb 2011 - June 2024

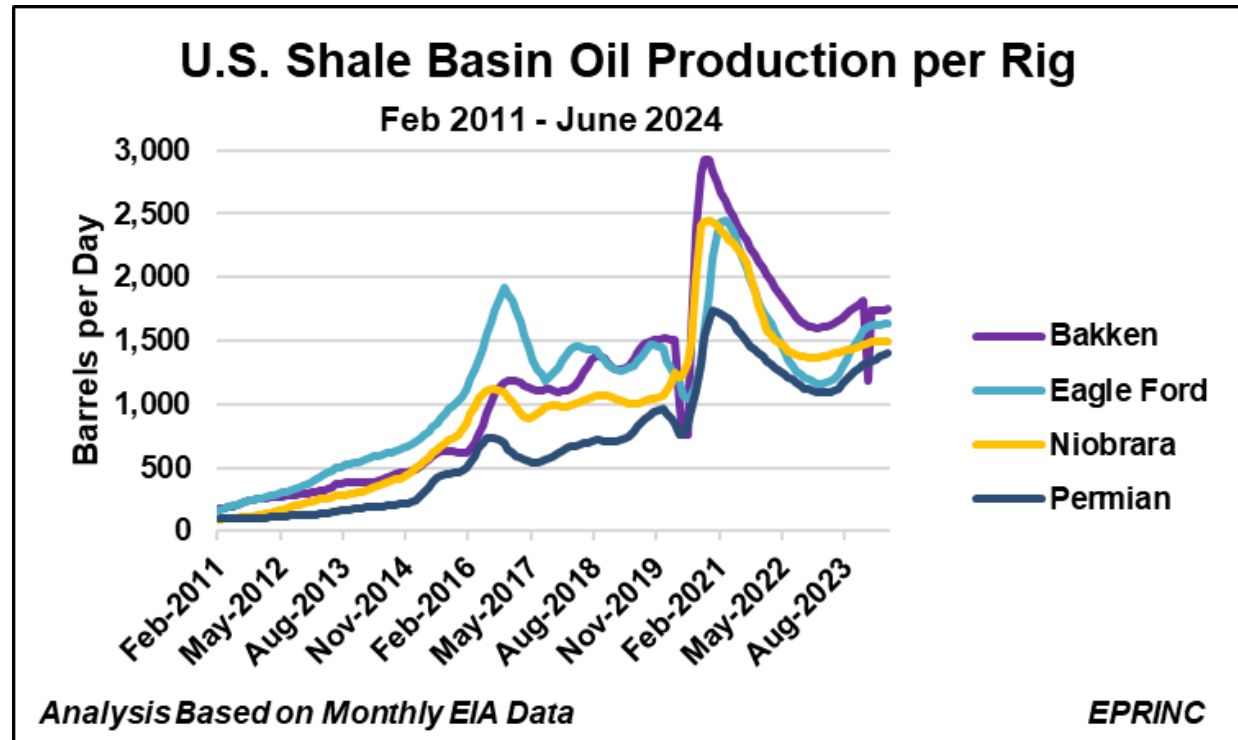
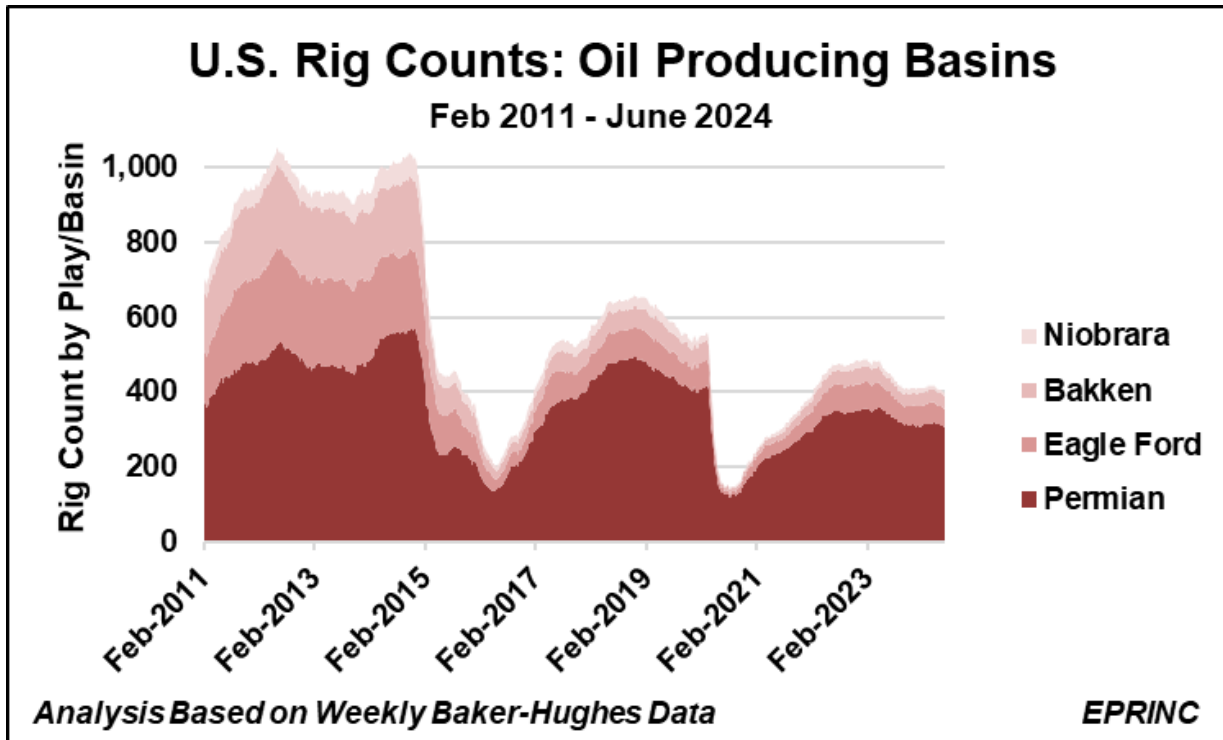


Analysis Based on Monthly EIA Data

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In the late 2000s, an Appalachian fracked well produced an average of 330 thousand cubic feet per day; by 2024 this had risen to 28.6 million cubic feet per day (*right pane*).

Productivity Improvements in U.S. Oil Producing Shale Basins



Permian fracked wells produced an average of 60 barrels per day (bpd) in 2007; in 2024 Permian wells were producing 1,400 bpd (*right pane*).

Measuring Productivity Improvements in U.S. Shale Oil and Gas Production



- Rig counts are a longstanding metric used to indicate shifts in hydrocarbon production. Generally driven by price movements, changes in rig counts in the past presaged shifts in production causing market participants to change their near-term expectations (the left panes in both Figure 1 and Figure 2, below). With the development of fracking, the key production technology for shale, rig counts have become less indicative of imminent production changes with recovery and productivity factors becoming more representative.
- Critically, shale is a porous rock formation permeated with hydrocarbons. Across the U.S. some of these formations are endowed with crude oil, others, with natural gas. Early production experience led to recovery factors ranging between 15% and 30% for natural gas, and 3% to 7% for oil because of its viscosity. Greater improvements in fracking coupled with increased data acquisition have led to higher recovery factors, and therefore higher productivity per well.
- In the U.S., the primary shale formations for natural gas are the Utica and Marcellus Shales straddling Eastern Ohio, Western Pennsylvania, and West Virginia, collectively referred to as Appalachia. The primary formation for crude oil is the Permian Basin located across West Texas and New Mexico.
- This slide deck is available at: <https://eprinc.org/chart-of-the-week/>
- For more information on these charts, please contact Max Pyziur (maxp@eprinc.org).