Reflections on a Decade of U.S. Shale Plays

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ABSTRACT

The Barnett, Fayetteville, and Haynesville shale gas plays are not profitable at $4/MMBtu (million British thermal units) Henry Hub gas prices. There are limited areas of the Marcellus Shale that are commercial at $4/MMBtu gas prices. The portions of shale gas plays that are potentially commercial at $6 gas prices represent less than 20% of the total drilled play areas accounting for price uplift from natural gas liquids. Commercial core areas of the Bakken and Eagle Ford shale oil plays similarly consist of less than 20% of the total drilled play areas; these are profitable at $95/barrel of oil equivalent West Texas Intermediate oil prices.

Shale plays have finite limits to commercial production that can be mapped as relatively discreet fields. Structural geology and correlative natural fracturing is an important factor in most plays. The life cycle of most shale plays is measured in years and not in decades.

While recent natural gas price spikes are clearly related to weather anomalies, they expose supply limits not generally recognized by industry analysts. Gas production as been essentially flat since February 2012 and production growth is now approaching zero. Gas production from conventional reservoirs accounts for approximately 57% of total gas supply and is declining at about 19% annually with few new wells being drilled. Barnett and Baynesville production is declining and Fayetteville and Eagle Ford production is flat. All gas growth is from the Marcellus Shale. Although the United States has abundant gas resources, supply constraints will become more frequent until prices increase and more gas-directed drilling ensues.

Berman, A. E., 2014, Reflections on a decade of U.S. shale plays: Gulf Coast Association of Geological Societies Transactions, v. 64, p. 659.