



Shale Gas Estimates Perhaps Optimistic - An Interesting and Worrying Talk at ASPO

Posted by [Heading Out](#) on October 14, 2009 - 10:08am

Topic: [Supply/Production](#)

Tags: [arthur berman](#), [barnett shale](#), [fayetteville](#), [haynesville shale](#), [marcellus](#), [natural gas](#), [natural gas prices](#), [shale gas](#) [[list all tags](#)]

Unfortunately I have had to miss the ASPO Meeting in Denver this week, and so cannot provide the daily reports that I have written in the past. But I notice that at least one of the talks has already caught a significant amount of press, and that is the one by [Arthur Berman](#) on the [gas production from shale](#) deposits such as the Barnett, Haynesville and Marcellus.

There has been a considerable hype in the press about the value of the gas from these shales, and the ability that they provide to bring in an "[Age of Natural Gas](#)". Commenting on the situation last year, the CEO of Chesapeake noted:

...the U.S. today consumes about 63 billion cubic feet of natural gas per day - in energy BTU equivalency terms, that's 10.5 million barrels of oil per day, or about half of the amount of oil that the U.S. consumes each day. Of that 63 bcf per day of natural gas consumption, we import about 1 bcf in the form of liquefied natural gas, or LNG, and we import about 8 bcf per day from Canada. This means that we are about 98.5% self-reliant on natural gas supply from North America and about 86% self-reliant on natural gas supply from the U.S. Contrast that with oil, where we are only about 41% North American self-reliant and only about 27% self-reliant from U.S. sources.

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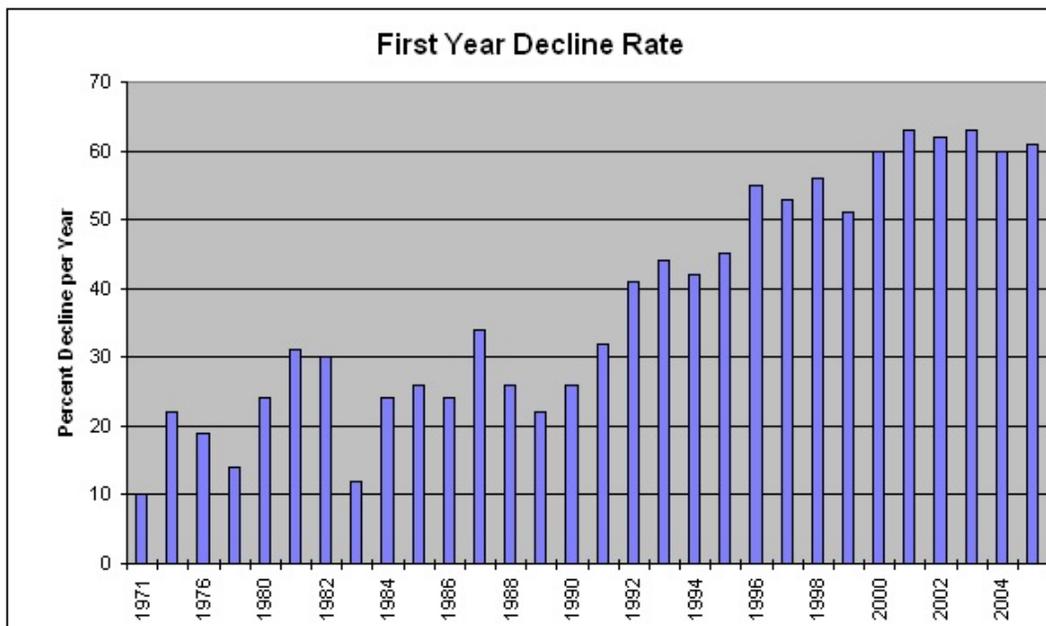
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This picture of a large supply of natural gas has been strengthened by the increase in production from a number of the gas shale fields, at the same time that the recession hit, and as a result there has been more gas available than needed, and the price has dropped considerably as a result. This, in turn, has led to a considerable reduction in the number of rigs that have been drilling new wells.

Natural gas has been steadily increasing its share of electricity generation, [rising to over 20%](#) of the market, on its way to 25%. Natural gas is favored because of its reduced carbon footprint over coal, and it has historically been used since it is somewhat easier to start and stop gas turbines than it is coal-fired power. Thus natural gas is seen as a favored backup to the installation of wind farms, where the vagaries of the wind are backed by the ability to use natural gas when needed.

There are, however, considerable concerns about the ability of wells in the gas shale to produce to the targets that are being set up. I first noted Arthur Berman's concern about this [back in 2007](#) when I drew attention to a piece he had written in [World Oil](#), where he noted the short life of most of the gas-producing wells; the very high costs for the wells and technology required to create them and, as a result, that only 28% of them return a reasonable profit. (Unfortunately the article itself is now behind a paywall).

Since then I returned to the topic at [Bit Tooth](#) showing, among other data, the very high decline rate (now 60%) of many of the gas wells in Texas (where the Barnett shale is) that [Swindell](#) has reported.



First year decline rates of Texas natural gas wells (after Swindell)

There is further disquieting news that is now coming out of the Barnett field. The [Ft Worth Weekly](#) has just reported that many of those who expected to make substantial amounts of bonus money from drilling companies using their leases have had the agreements withdrawn and lost

In April 2008, the Southeast Arlington Communities of Texas (SEACTX) negotiated a deal with XTO Energy that would bring in bonus money of \$26,517 per acre and a royalty rate of 26.5 percent - among the highest in the Barnett Shale play. When leaders of SEACTX, representing about 7,000 property owners with about 5,000 acres, did the math, they figured that more than \$100 million in upfront bonuses would be coming into their community of mostly modest to middle-class neighborhoods. Well, that was then and this is now, when natural gas prices have fallen to less than half what they were in early 2008. And as anyone who has been following the Barnett Shale saga knows, drilling companies pulled out of those deals and others in mid-October of last year. Some property owners, whose bonus checks were processed prior to the cancellation, got paid. Tolly Thomas, a spokeswoman for SWFA, estimated that 4,000 to 5,000 people in her area got the money promised to them - and the other 20,000 or so did not.

Prices for drilling these wells run on the order of \$5 million apiece, and Chesapeake has, in the past, noted that it takes \$4.00/kcf to bring in enough money to cover those costs – with a good well. (Note that this is the [Henry Hub price](#), consumers should add about \$3 to this to get the residential price). Those numbers are considerably higher than the ones that Mr. Berman used with his calculation two years ago that only 28% of the wells will be financially remunerative.

He recently ([April 2009](#)) expressed similar concerns about the Haynesville wells – though his production decline numbers are stunningly higher – as much as 20-30% in a month, for an annual decline rate of 80-90%. The costs that he cites are up at the \$7.5 to \$9.5 million range for the wells, with a net final cost that the producer has to pay in the region of \$7.25/kcf. He therefore concludes that the breakeven point for wells in the Haynesville lies at a price of around \$9/kcf Henry Hub; with a minimum reserve of some 2.5 Bcf. He upgraded that opinion [in June](#) expressing a concern, that I echo, with the availability of natural gas from a variety of sources (including the Rocky Mountain Express and increased LNG shipments) which will make it difficult to sell gas from formations such as the Haynesville, at a profit.

In his [most recent post](#) on the subject some of the possible reasons for the rapid decline (which fall a little along the same explanation as I gave on [chalk collapse](#)) which are as follows:

An abnormally high-pressure gradient (0.7-0.9 psi/ft) distinguishes the Haynesville from other shale plays. It may also explain the extremely high decline rates, as pressure depletion transfers stress to the rock and allows proppant-filled and open fractures to compress, thereby reducing the effective reservoir permeability.

Unfortunately for the hopes of a new age for gas, in preparation for a meeting on the Haynesville production last week, he had calculated the numbers for some 67 wells in the Haynesville and was still coming up with decline rates of 25% a month.

He also noted:

The average EUR in our study is 1.72 Bcf/well, compared to the 6.5-7.5 Bcf/well reported by many operators. Only two wells of the 67 evaluated have an EUR greater than 6.0 Bcf. At the same time, seven wells have already produced more than 2 Bcf and one has exceeded 4 Bcf.

Petrohawk has the best well performance with an average EUR of 3.4 Bcf/ well (19 wells evaluated). Chesapeake has the most wells on production (29 wells evaluated) but we project an average EUR of only 1.2 Bcf/well.

It sounds as though I missed a really interesting and valuable talk – just have to wait for the DVD's to come out, I guess!! I plan to reorder some of the technical talks on Sundays so that I can more fully explain his concern about the Haynesville shale.



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