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I write about plays and trends in the oil and gas business.

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Why U.S. Natural Gas Prices Should Double

Natural gas prices should double over the next year.

Over-supply plus a warm 2015-2016 winter have resulted in low gas prices. That is about to change because supply is decreasing (Figure 1).

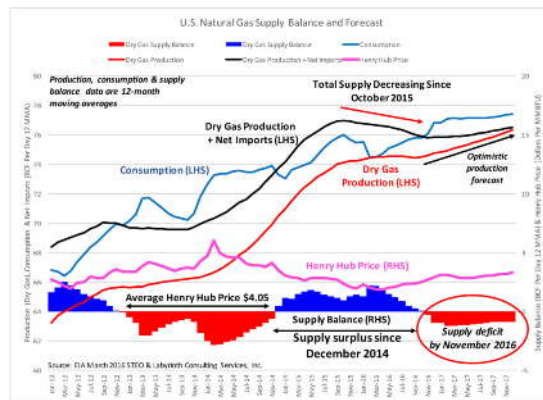


Figure 1. EIA U.S. natural gas supply balance and forecast. Production, consumption and supply balance values are 12-month moving averages. Source: EIA and Labyrinth Consulting Services, Inc.

Total supply—dry gas production plus net imports—has been declining since October 2015* because gas production is flat, imports are decreasing and exports are increasing. [Shale gas production](#) has stopped growing and [conventional gas](#) production has been declining for the past 15 years. As a result, the supply surplus that has existed since December 2014 is disappearing and will move into deficit by November 2016 according to data in the EIA March [STEO](#) (Short Term Energy Outlook) .

During the last supply deficit from December 2012 to November 2014, Henry Hub spot prices averaged \$4.05 per mmBtu. Prices averaged \$1.99

per mmBtu in the first quarter of 2016, so it is reasonable to assume that prices may double during the next period of deficit.

EIA forecasts that gas prices will increase to [\\$3.31](#) by the end of 2017 but that is overly conservative because it assumes an immediate and improbable return to production growth once the supply deficit and higher prices are established (Figure 1).

Production companies are in financial distress and are unlikely to return to gas drilling at the \$2.75 price that EIA forecasts for November 2016. The oil-field service industry is in disarray and is probably unable to reassemble drilling and fracking crews and equipment in less than 6 to 12 months after demand resumes.

There are currently [92 rigs](#) drilling for gas. That is 150 rigs less than the previous record-low set in 1992 (Figure 2). Production cannot be maintained at this level despite unrealistic faith in drilling efficiency and spare capacity from uncompleted wells.

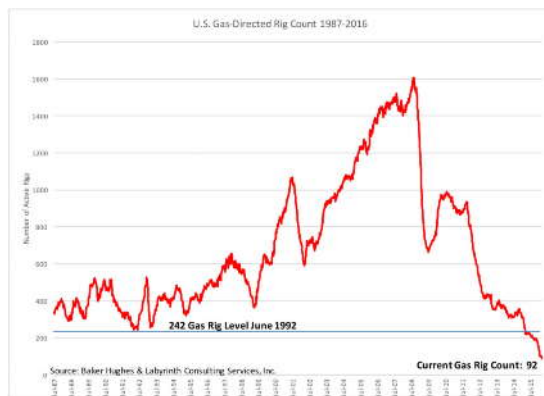


Figure 2. U.S. gas-directed rig count, 1987-2016. Source: Baker Hughes and Labyrinth Consulting Services, Inc.

A Tale of Two Price Cycles

Storage and production patterns for 2015 – 2016 appear quite similar to patterns observed in 2011 – 2012. Both periods are characterized by exceptionally high storage and comparative inventory levels, and record-low spot gas prices.

The storage and comparative inventory surplus of October 2011 – March 2012 disappeared as gas supply fell in response to low prices (Figure 3). By April 2013, gas prices were near \$4.20 because the surplus had become a deficit. A cold winter sent prices above \$6.00 in February 2014.

A similar pattern may be occurring in 2016.

The monthly average Henry Hub price for gas in March 2016 was \$1.71 per mmBtu. That is the lowest CPI-adjusted monthly price (February 2016 dollars) in 40 years (Figure 3 shows 1999-present). The previous record low price was \$2.01 in April 2012. The 2012 low coincided with a comparative inventory peak followed by an inventory deficit and gas prices that exceeded \$4.00 by December 2013. The current 2016 price low must be near the latest comparative inventory peak.

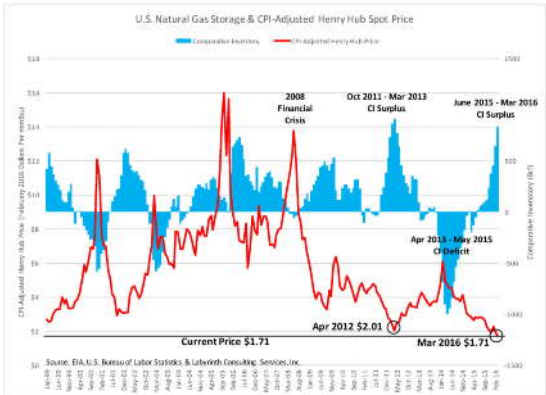


Figure 3. U.S. natural gas storage and CPI-adjusted Henry Hub spot price in February 2016 dollars per mmBtu. Source: EIA, U.S. Bureau of Labor Statistics and Labyrinth Consulting Services, Inc.

Comparative inventory is a measure of gas storage volume compared to a moving average of inventory values for the same time period over the 5 previous years. Comparative inventory (CI) provides an excellent negative correlation with natural gas spot prices.

Absolute [storage](#) levels were nearly the same for the last week of March 2016 (2,468 Bcf) and the last week of March 2012 (2,472 Bcf), and 2016 appears to be trending lower relative to 2012 (Figure 4).

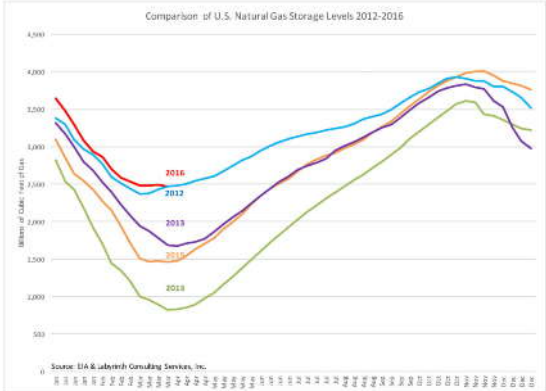


Figure 4. Comparison of U.S. natural gas storage levels, 2012-2016. Source EIA and Labyrinth Consulting Services, Inc.

Gas production was flat from February 2012 through December 2013 in response to the price collapse that culminated in April 2012 (Figure 5). The price minimum coincided with a supply surplus maximum that disappeared and became a supply deficit by February 2013.

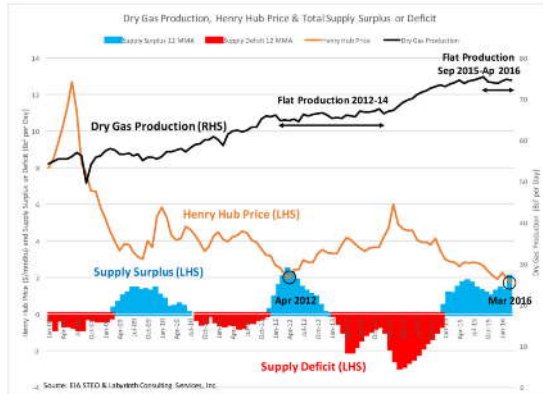


Figure 5. Dry gas production, Henry Hub prices and total supply surplus or deficit. Supply surplus and deficit values represent 12-month moving averages as in Figure 1. Source: EIA and Labyrinth Consulting Services, Inc.

Gas production has been flat since September 2015 (Figure 5). Total dry gas production in March 2016 was 0.7 bcf/d less than in September 2015 and the latest EIA data indicates that production for April is [1.2% \(-0.83 bcf/d\)](#) less than a year ago. EIA's supply forecast (Figure 1) suggests that the present surplus will become a deficit later in 2016.

Why Natural Gas Prices Will Double

I used the EIA March 2016 STEO [inventory forecast](#) to calculate comparative inventory for the rest of 2016 and 2017. This data indicates a fall in comparative inventory beginning in April or May 2016 (Figure 6).

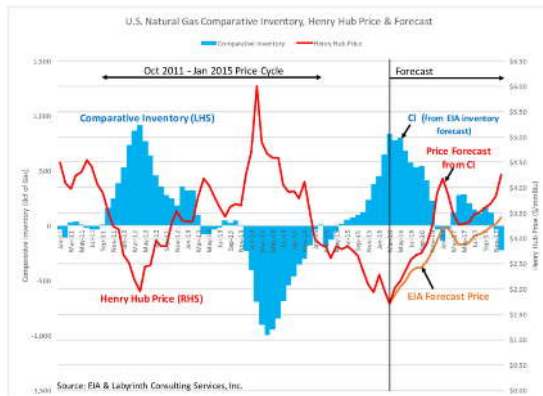


Figure 6. U.S. natural gas comparative inventory, Henry Hub price and forecast. Source: EIA and Labyrinth Consulting Services, Inc.

That should result in a return to higher gas prices. The price estimate based on comparative inventory (shown in red) is more bullish than EIA's price forecast (shown in orange) but both indicate a substantial percentage increase in prices.

EIA forecasts \$3.20 gas prices in January and February 2016, and \$3.41 in December 2017. My forecast based on comparative inventories is about 15% higher overall than EIA's but peak prices are 20-30% higher. It calls for winter prices in the \$4-range for 2016 and 2017.

Putting Prices In Perspective

A doubling of gas prices to \$4.00 per mMBtu may seem too optimistic based on current price levels that have averaged about \$2.00 since the beginning of 2016. Yet average prices since 1976 are \$4.61 in 2016 dollars and the modal price for that period is \$3.50 (Figure 7).

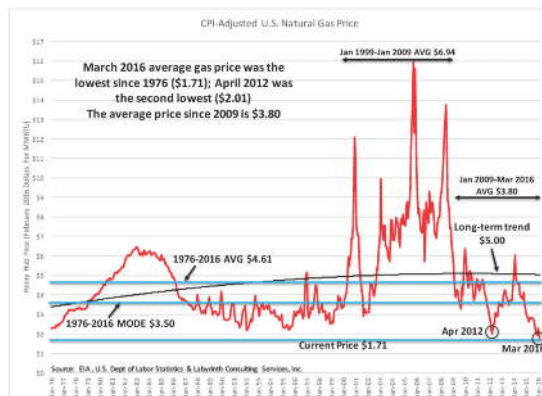


Figure 7. CPI-adjusted Henry Hub price and forecast (February 2016 dollars per mMBtu. Source: EIA, U.S. Bureau of Labor Statistics and Labyrinth Consulting Services, Inc.

Moreover, the average price since January 2009 is \$3.80 (2016 dollars) and the long-term trend-line since 1976 is more than \$5.00 per mMBtu.

All the data presented in this analysis suggests that present gas prices represent the low point in a price cycle similar to October 2011-January 2015 in which \$2 gas was the bottom in an overall cycle whose average price was \$3.65. That price is consistent with average prices since 2009 and the long-term modal price. The average of 2011-2015 peak prices (November 2013-December 2014 period of negative comparative inventory—Figure 6) was \$4.34 per mMBtu.

My forecast for gas prices to average \$3.65 in 2017 (Figure 6) is in fact conservative. It is based on the dubious EIA assumption that producers will immediately respond to an increase in gas prices to about \$2.35 per mmBtu (their forecast price) with renewed drilling and that production will increase strongly throughout the rest of 2016 and 2017.

That is what happened in early 2014 (Figure 5) but then, gas prices were more than \$6 and external capital was readily available before the oil-price collapse that began later that year. Although [capital](#) is still available, companies are more likely use it to pay down debt than to resume drilling especially for gas at least for the rest of 2016 and possibly longer.

The days of pure gas players are pretty much over and liquids are a more attractive drilling target than natural gas at any price. Having said that, the best operators in the Marcellus Shale play need \$3.50 to \$4.00 gas prices to break even and most need \$4.25 to \$5.50. In the Utica and Woodford plays, most operators need at least \$5.00 to \$6.00 prices to break even.

February gas production has declined 0.7 bcfd from its peak in September 2015. EIA's production forecast calls for a 1 bcfd increase by December 2016 and an almost 3 bcfd increase by December 2017. It is difficult to imagine that either price forecast shown in Figure 6 would result in the drilling resurgence necessary to realize those higher rates.

That is why it is probably conservative to suggest that gas prices may double in the next year or so.

*Production, consumption and supply balance data in Figure 1 are 12-month moving average values.

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