

# RBAC Inc.

Energy Industry Forecasting Systems

## **A Wind from the Northeast: Major Changes Coming in Gas Market Pricing**

Dr. Thomas J. Woods, RBAC, Inc., August 22, 2012

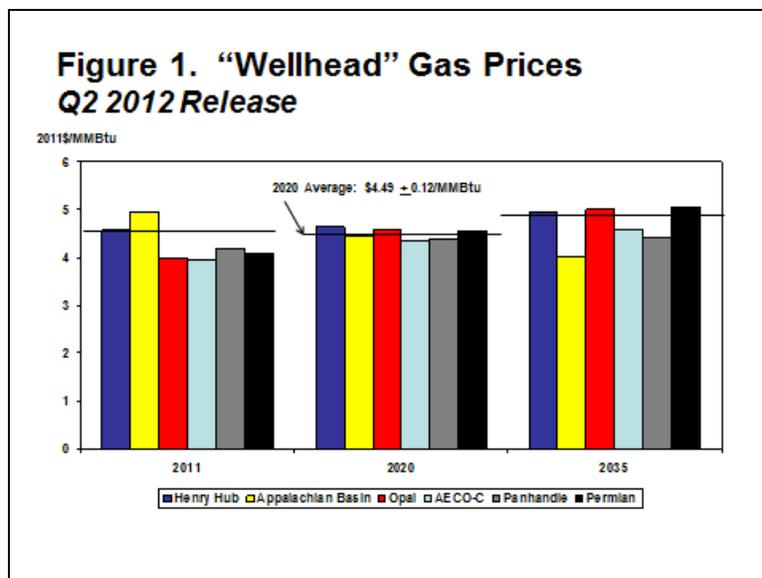
The competitive gas market in North America, which began to emerge in the 1980s, had its focus at Henry Hub (Louisiana), the physical pricing point for natural gas futures traded on NYMEX. Gas production on the Gulf Coast was delivered throughout North America east of the Mississippi, where it competed with gas production from other North America producing regions (e.g., Western Canada, west lower-48, Midcontinent). Thus, Henry Hub prices provided a useful marker for North American gas prices (wellhead or marker), either directly or indirectly. However, surging Appalachian Basin gas production has begun to push out gas deliveries from traditional North American producing regions to the Northeast and is now flowing westward and southward displacing traditional production out of these regions too. A critical issue is the impact of growing Appalachian gas production on Henry Hub's role as a marker for North American gas prices.

In 2011, annual gas production in the Appalachian Basin tested 2 Tcf, and is approaching 3 Tcf in 2012. This has substantially reduced the call on Gulf Coast and Western Canada gas production by the Northeast states. In its Q2 2012 release, the GPCM® Natural Gas Market Forecasting System indicates that Appalachian Basin gas production is expected to exceed 80% of Northeast gas demand in 2012. By 2014, annual production will exceed Northeast gas demand. In 2035, annual Appalachian production will be greater than twice Northeast gas consumption. Thus, a growing share of Appalachian gas production will flow westward into Midwest states and southward into South Atlantic states pushing back Gulf Coast, Midcontinent, Permian Basin, Western Canada, and Rocky Mountains production from these regions. This will significantly affect regional gas prices in North America.

In 2011, North America wellhead prices spanned a range of \$1.00 per MMBtu in 2011\$, with Appalachian wellhead prices being highest and AECO-C prices the lowest. In the Q2 2012 release, wellhead gas prices close on each other to span a range of only \$0.25-0.30 in 2016-2020. After 2020, prices diverge.

Figure 1 presents annual gas prices for 2011, 2020, when 2.3 Tcf of Appalachian Basin production is looking for a market outside the Northeast, and 2035, when almost 4.4 Tcf is looking for a market.

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In 2011 Appalachian wellhead prices were the highest in North America, Henry Hub the second highest, and western (Opal and AECO-C) wellhead prices the lowest. The westward and southward pushes of Appalachian gas begin to “create” a North American gas price. In 2020, these six regions will have an average wellhead price of \$4.49 and their prices span a range of \$0.28. However, by 2020, the Henry Hub will have the highest North American wellhead price. AECO-C will still have the lowest price.

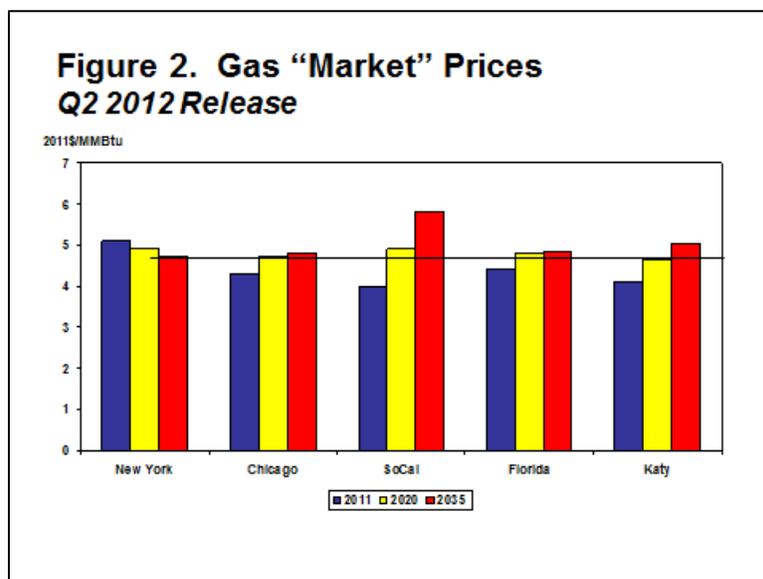
As Appalachian gas production continues to grow after 2020, its wellhead gas production prices will decline because Appalachian gas production has to move farther upstream in competition with other regions. By 2022 Appalachian Basin gas production will have the lowest price. The three highest prices in 2035 will be Henry Hub, Opal, and the Permian Basin. Panhandle prices will be somewhat lower than AECO-C prices. While one can conclude that the growth in Henry Hub prices after 2011 include significant resource “cost” considerations, changes in other regional prices will have a significant gas transportation component in them.

Varying differentials among North American wellhead prices in the coming years suggest the role of Henry Hub prices as a contract price marker will have a shrinking geographic utility. Appalachian wellhead prices, especially Dominion South Point, could expand their role as contract price markers from the Northeast into the Midwest and the South Atlantic regions. Expansion into the Midwest will compete with western (Opal, AECO-C), southwestern (Permian, Panhandle), and Gulf Coast (Henry Hub) gas production. In fact, 12Q2 results for 2035 indicate that Henry Hub and Permian gas production will have been essentially displaced from Midwest markets and Permian Basin production from Gulf Coast markets (displaced by a flow back of “Henry Hub” gas), and will essentially only flow westward to compete against western (Opal, AECO-C) prices. Western (Opal, AECO-C, Permian) wellhead gas prices will be mostly used as gas price contract markers in western lower-48 and Canada markets. The bottom line message for the role of Henry Hub as a contract price marker outside of the Gulf Coast and parts of the South Atlantic is caveat emptor.

## A Wind from the Northeast

Gas market prices, which can be a proxy for burner tip prices, show a different geographic variation over time. Five regional prices (Transco Z6 New York, Chicago, SoCal, Florida, and Katy) are compared below. This comparison suggests that the shift in production sources will divide North America into four regions, a western market, a “Henry Hub” market, a Midwest market, with competition among Appalachian, Western Canada, and Panhandle production, and an eastern market served by Appalachian production, with competition between Henry Hub and Appalachian production in its far south (e.g., Georgia, Florida).

Pacific Coast and Mountain (West) gas markets have generally had the lowest lower-48 market prices, and Gulf Coast markets the next lowest. The Q2 2012 release expects that Pacific Coast gas prices will exceed Midwest and Northeast prices in 2012 and 2016 respectively, and that difference will widen over time. By the end of the projection, SoCal prices will exceed the average of the Midwest/Northeast prices by more than \$1.00. Figure 2 shows annual gas market prices for the five points in 2011, 2020, and 2035.



Market prices downstream of Appalachian gas production will decline, reflecting eroding Appalachian Basin wellhead prices as Appalachian production begins to expand west and south. By 2030 the New York price will become the lowest of the five, in contrast to being the highest in 2011.

Chicago prices grow in 2011-20 due to recovery in gas commodity prices from their 2011-12 lows. However, they show little change after 2020 despite noticeable growth in non-Appalachian wellhead prices, reflecting the effect of gas-on-gas competition among the producing regions to deliver gas to the Midwest. California market prices grow steadily, becoming the highest market area price in 2018. This reflects the large growth in Western (Permian, Opal, AECO-C) gas wellhead prices as their production is displaced from eastern and Midwest markets by large growths in Appalachian Basin and Midcontinent production. Florida prices grow in 2011-20, but growth slows substantially after 2020, reflecting effects of deeper penetration of Appalachian gas into the South Atlantic and gas-on-gas competition with Henry Hub. Katy prices grow over the projection, reflecting growth in Henry Hub prices.

## A Wind from the Northeast

Overall Western gas users are likely to experience the highest growth in gas prices over the next 25 years, and Northeast prices through to New York will see declines from their 2011 level. Market prices in the neighborhood of Henry Hub will grow steadily as a result of growth in Henry Hub gas prices. While gas market prices in the Midwest and South Atlantic markets will grow modestly between 2011 and 2020 (but little growth between 2010 and 2020), this growth largely reflects gas commodity price recovery from their 2011-12 lows. Long-term, gas prices in the Midwest and South Atlantic are likely to show little growth after 2020, reflecting gas-on-gas competition in the regions between Appalachian Basin gas and other gas sources.

### Final Observations

The North American gas market is undergoing significant transformations as the Appalachian Basin becomes a major source of North American gas supply and begins to look for markets to the west and south, displacing production from other areas. Appalachian gas production penetration of Midwest and South Atlantic gas markets will continue to grow. The Q2 2012 release expects that after 2030, more than half of Appalachian production will be looking for markets outside of the Northeast (Middle Atlantic and New England). As a result, gas market prices in the four general regions will move in differing directions over at least the next 25 years.

Current rules of thumb, long-term regressions, general relationships, and expectations that grew up in a “Henry Hub”-dominated world may find their applicability reduced in scope or even inapplicable. The Northeast and perhaps some of the South Atlantic will become generally the regions of the lowest lower-48 gas prices. On the other hand, western gas markets, which have had the lowest gas prices in North America, will have the highest gas prices in the coming years. One of the physical changes that has not been discussed in this paper is the transition of some long-distance eastern and Midwest pipelines from one-way to two-way gas movement as Appalachian gas moves into the Midwest and South Atlantic states. With two-way flow, pipelines may begin to serve as both transmission and longitudinal storage (as the Northwest Pipeline does in the Washington-Wyoming corridor), and this may have some additional impact on Eastern gas storage and gas market prices.

RBAC has been the leader in building the fundamental analysis tools used by the energy industry and related government agencies for nearly two decades. The GPCM<sup>®</sup> Natural Gas Market Forecasting System<sup>™</sup> is the most widely used tool of its kind in its markets. RBAC other products include the GPCM Daily<sup>™</sup> Gas Model, GPCM Viewpoints<sup>®</sup>, NGL-NA<sup>™</sup> Model, Global Gas Market Model (G2M2<sup>™</sup>) and a power model interface (GPCM-PMI<sup>™</sup>) for power demand modeling that integrates with Natural Gas and other fuels. (<http://www.rbac.com>)