

# THE CRUCIBLE REPORT

SEPARATING TRUTH  
FROM FICTION IN THE  
NATURAL GAS MARKET

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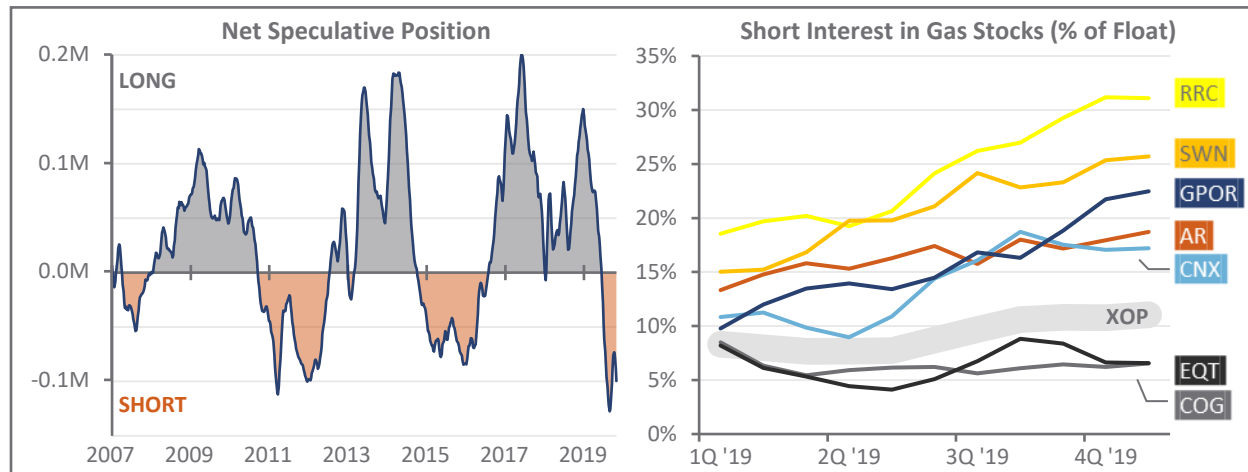
*Separating Truth from Fiction in the Natural Gas Market*

*“A great deal more is known than has been proved.” – Richard P. Feynman*

## INTRODUCTION – THE WIDOW MAKER

Natural gas is everyone’s favorite commodity to hate. As recently as mid-October, natural gas prices had fallen 30% in 2019, and the stock prices of many natural gas producers are down between 50-80% for the year. No wonder they call natural gas “the widow maker.”

Speculative positioning in the commodity and the stocks reflect a high level of conviction that the downdraft is likely to persist.



Sources: BMO Net Speculative Position: Futures + Options + Swaps, 11/1/2019; FactSet, 11/1/2019<sup>1</sup>

The narrative supporting this bleak outlook revolves around two key tenets. First, that zero-cost associated gas volumes will continue to grow and outstrip demand, placing significant downward pressure on the commodity for the foreseeable future. Second, that the recent supply surge from the Utica and Haynesville shales are proof that North America possesses a massive inventory of very low-cost, capital-efficient wells which will keep the market oversupplied at depressed prices even after associated gas volumes begin to moderate.

An alternate view is that the growth in associated gas volumes has only offset conventional declines, and that the recent supply surge has more to do with capital availability and contracting commitments than underlying economics.

In this report, we attempt to provide some context to the current debate, and to highlight the key issues that will determine how the gas market unfolds. We believe that these themes and regions will form the crucible for natural gas and the related equities over the next few years.

## COMMODITY PRICES IN CONTEXT

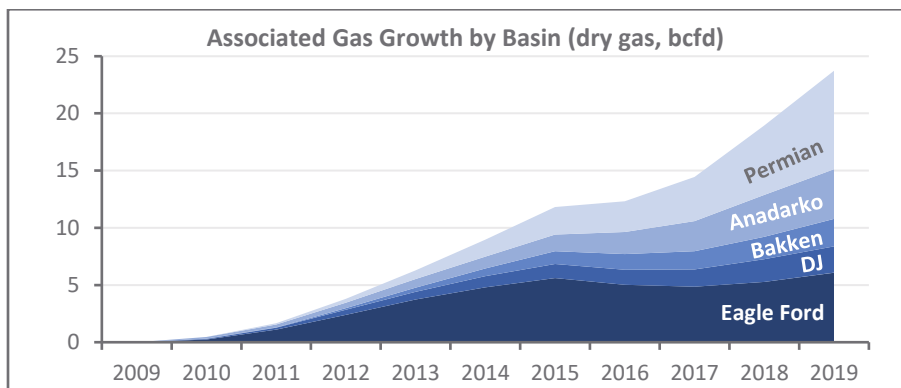
Natural gas prices have averaged between \$2.50-\$4.50/mcf over the last decade. As recently as July 2019, the trailing year average was \$3.00/mcf.

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Conventional wisdom seems to be that the North American market will balance between \$2.00-\$2.50/mcf in the future. This view must be based on either rapidly shrinking demand (North American natural gas has one of the most attractive demand growth profiles of any major commodity) or a significant increase in low-cost supply.

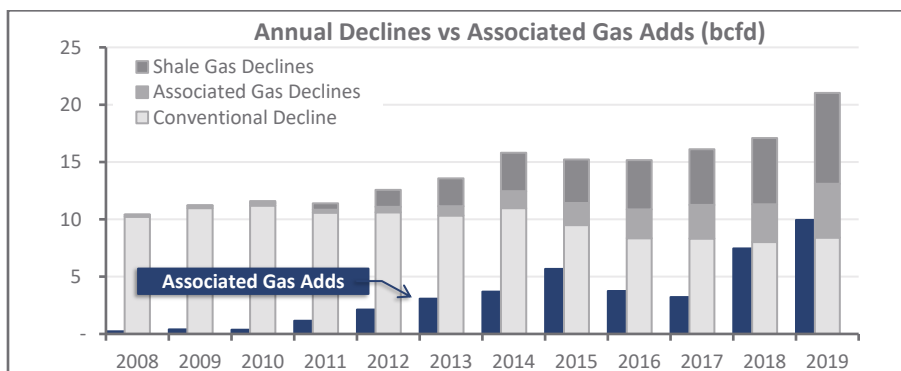
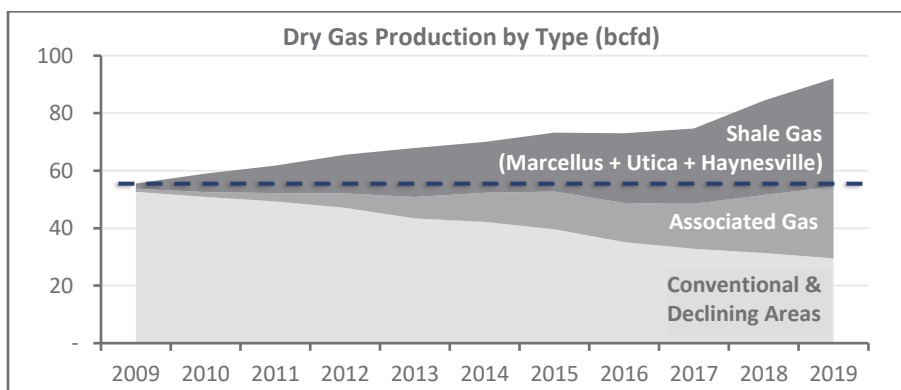
## ASSOCIATED GAS

The primary supply fear is related to associated gas, specifically Permian associated gas. For reference, associated gas production has grown significantly over the past decade with the emergence of shale oil, and we expect that it will continue to increase into the future (although we are skeptical of U.S. oil growth forecasts – a topic for another day).



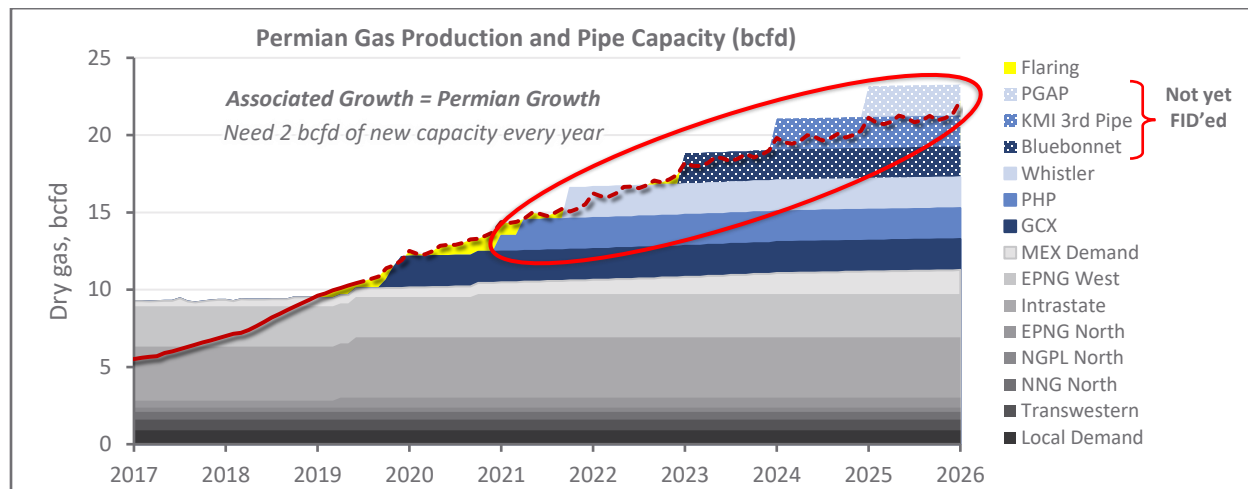
Sources: DrillingInfo, 3Q 2019; SSCP estimates, 3Q 2019

However, it is important to note that thus far, **associated gas volumes have not added to net production**. In fact, since the start of the shale revolution, they have merely offset declines from conventional production and more mature shale plays like the Barnett and Fayetteville.



Sources: DrillingInfo, 3Q 2019; SSCP estimates, 3Q 2019

Going forward, we expect Permian associated gas production to continue to grow with the primary constraint being pipeline capacity. In our forecast, we assume that new pipes are filled as they come on stream, as shown in the chart below.



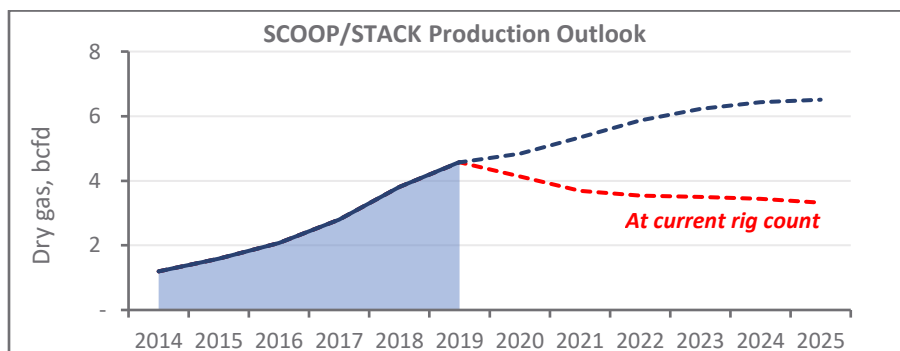
Sources: DrillingInfo, 3Q 2019; U.S. Capital Advisors, 3Q 2019; SSCP estimates, 3Q 2019

Note that recent commentary from Kinder Morgan suggests that PHP may be delayed due to regulatory concerns while the top three pipelines have yet to be FID'ed, due in part to insufficient volume commitments from producers.

This dynamic bears watching, as a lack of takeaway commitments may imply less aggressive growth from the Permian than many forecast. In the interim, however, we assume that the pipes are filled per the schedule above so that going forward associated natural gas volumes should be a net positive contributor to supply, predominately driven by the Permian Basin.

### CRUCIBLE #1 – SCOOP/STACK (ASSOCIATED) GAS

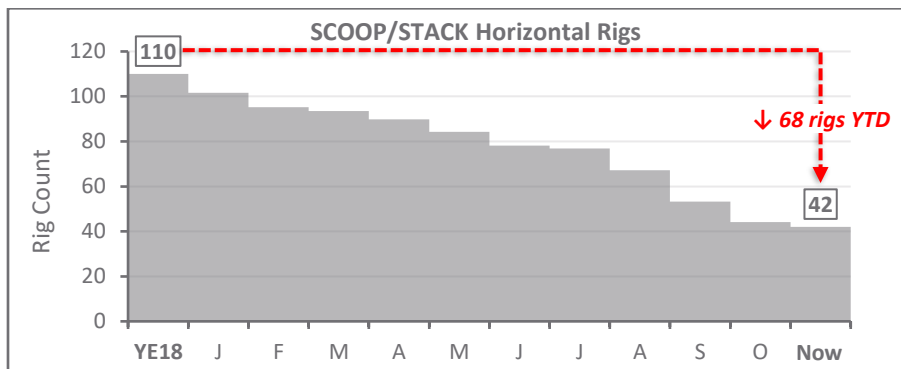
It is important to note that Permian associated gas production currently is less than half of total shale oil-related gas volumes, accounting for 12.5 bcfd out of a total of 30 bcfd on a wet gas basis in 2019. The remaining production comes from the Eagle Ford, Anadarko, Bakken, and DJ basins. Of the four non-Permian associated gas plays, the Anadarko Basin has grown the most over the last few years driven by activity in the SCOOP/STACK. Going forward, we expect non-Permian associated gas production to grow, although more slowly than Permian volumes. A large part of that growth – roughly 70% over the next five years – is forecast to come from the SCOOP/STACK.



Sources: DrillingInfo, 11/1/2019; SSCP estimates, 3Q 2019

While we can debate whether the SCOOP/STACK is an oil or a gas resource, the reality is that a significant amount of capital has been deployed to delineate and drill out the basin, particularly over the

last four years. The plays have proven to be extremely heterogenous, with some high-profile bankruptcies in certain parts of the basin, and activity levels reflect this reality. The rig count has plummeted from 110 at the beginning of 2019 to 42 today. For reference, this is the same number of rigs that were running at the 2016 trough.



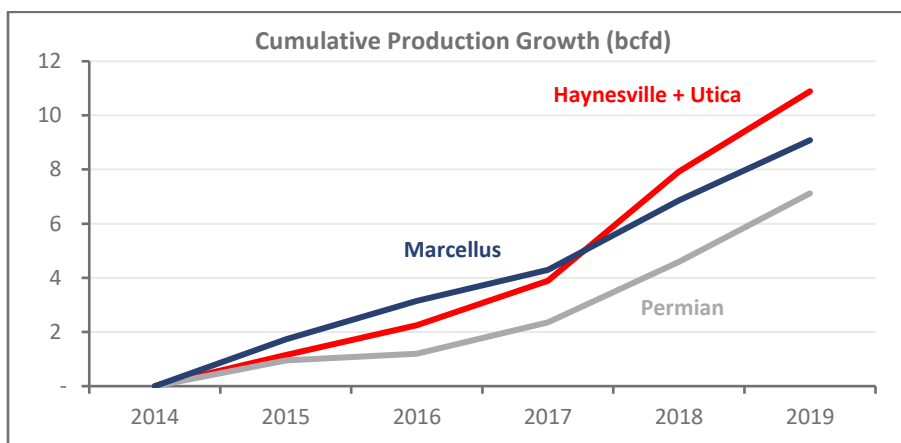
Source: DrillingInfo, 11/1/2019

Private E&Ps have gone from 30 rigs to 13, Continental has gone from 22 rigs to 11, and basin stalwart Devon, who purchased Felix at the end of 2015 for \$2.5bn and promptly ramped their rig count from 2 to 10, is no longer drilling at all.

To date, we haven't observed much in the way of a production response to the recent drop in the rig count, but it is inevitable. Even a flattening of volumes at current levels would remove more than 2 bcf/d of associated gas volumes from our forecast, or about 70% of our non-Permian associated gas growth forecast through 2025. A more likely **decline in SCOOP/STACK associated gas production would put a significant dent in overall associated gas growth heading into 2020**. We estimate that at the current rig count, volume would fall from 4.7 bcf/d currently to 4.3 bcf/d exiting 2020.

## CRUCIBLE #2 – UTICA SHALE

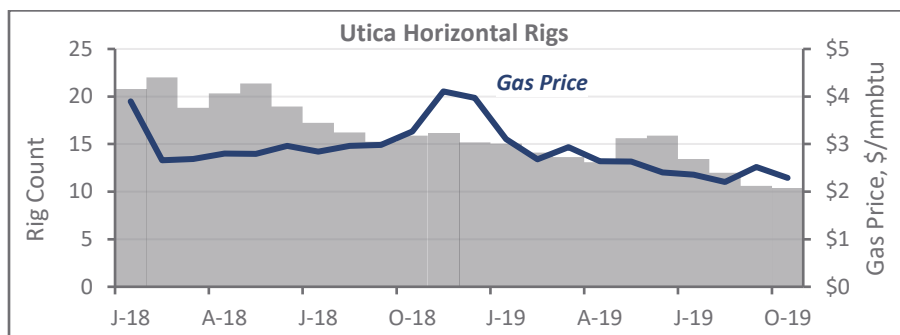
While the market is obsessed with the economically rational growth in associated gas, very little attention has been paid to the two natural gas basins that have produced the bulk of incremental volumes over the past few years. In fact, since 2014 the Utica and Haynesville shales together have grown dry gas production more than either Permian associated gas or the Marcellus.



Sources: DrillingInfo, 3Q 2019; SSCP estimates, 3Q 2019

There have been many debates about the economics of the Utica Shale, but the rigs don't lie. At the beginning of 2018, there were 10 companies operating a total of 21 rigs, which was about the post-2014 cyclical peak. Of those 10 companies, only four are drilling in the basin today. The rig count has fallen more than 50% to 10, evenly split between public and private companies. The largest producer in the

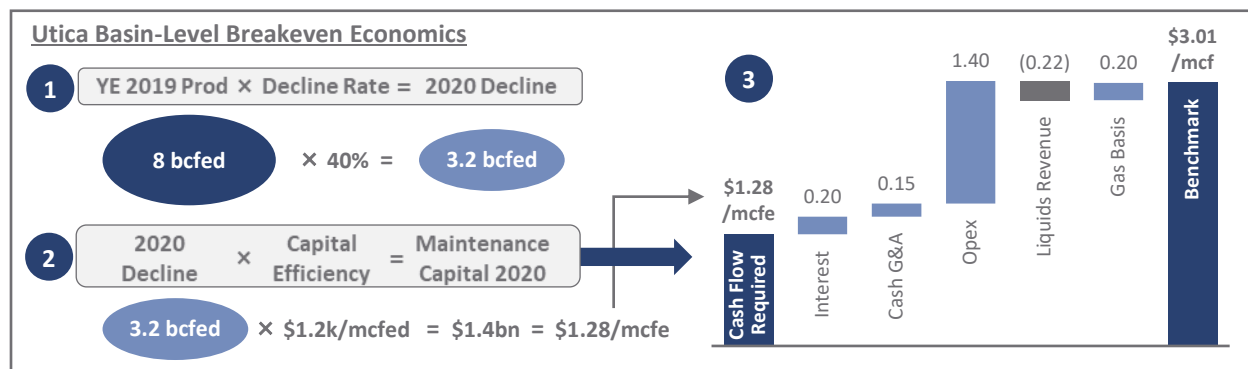
basin, privately held Ascent, has now filled its FT commitments and is moving to maintenance mode, with a resulting drop in drilling activity.



Sources: DrillingInfo, 3Q 2019; SSCP estimates, 3Q 2019

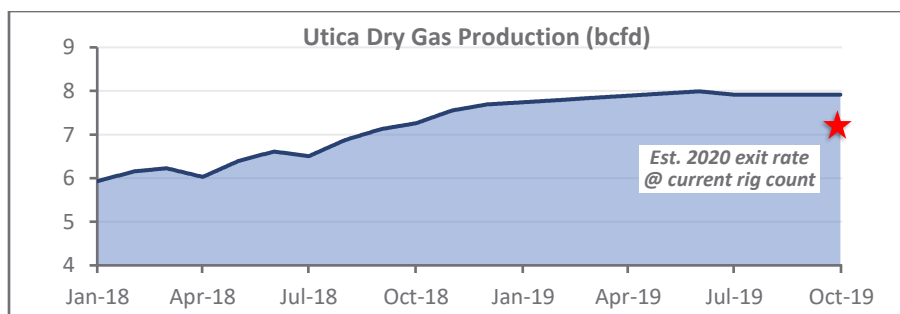
Operators with other areas to develop – such as Antero, Chesapeake, Cabot, and Hilcorp – have abandoned their Utica programs. Even Gulfport, which was among the most active drillers in the basin before acquiring a position in the SCOOP (see above) for \$1.85bn, is no longer operating a rig. So, all debates aside, **it's clear that the Utica is uneconomic in the current price environment, and that even at prices closer to \$3.00/mcf, companies with other options redeployed capital outside of the basin.**<sup>2</sup>

This conclusion is corroborated by the financials of Utica producers. The table below shows that at the corporate level, the basin needs natural gas prices of approximately \$3.00/mcf to generate sufficient cash flow to replace base declines.



Sources: Financial filings of public and private companies, 3Q 2019; SSCP analysis, 4Q 2019

Supply growth, of course, would require either external capital or higher commodity prices. Conversely, the current rig count implies a 2020 exit rate 0.5-1.0 bcfed below current production.



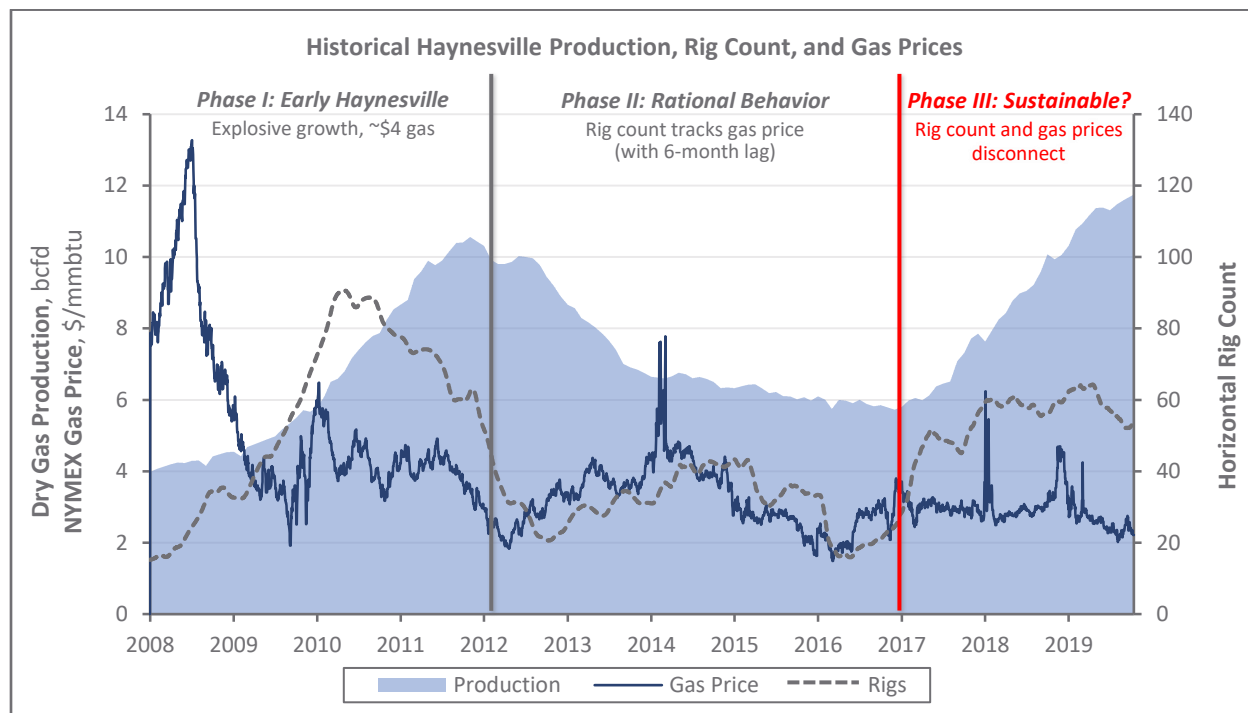
Sources: DrillingInfo, 3Q 2019; SSCP estimates, 3Q 2019

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We believe that the Utica will struggle to maintain flat production at the current rig count, reflecting the cash flow realities of the basin. Flat-to-down volumes from one of the key growth engines over the past five years would meaningfully change supply-demand balances in the future.

### CRUCIBLE #3 – HAYNESVILLE SHALE

The dissonance around activity levels and economics/cashflows is most extreme in the Haynesville Shale. Volumes from the play have more than doubled in the past four years as the rig count tripled to over 60 in the first half of 2019.



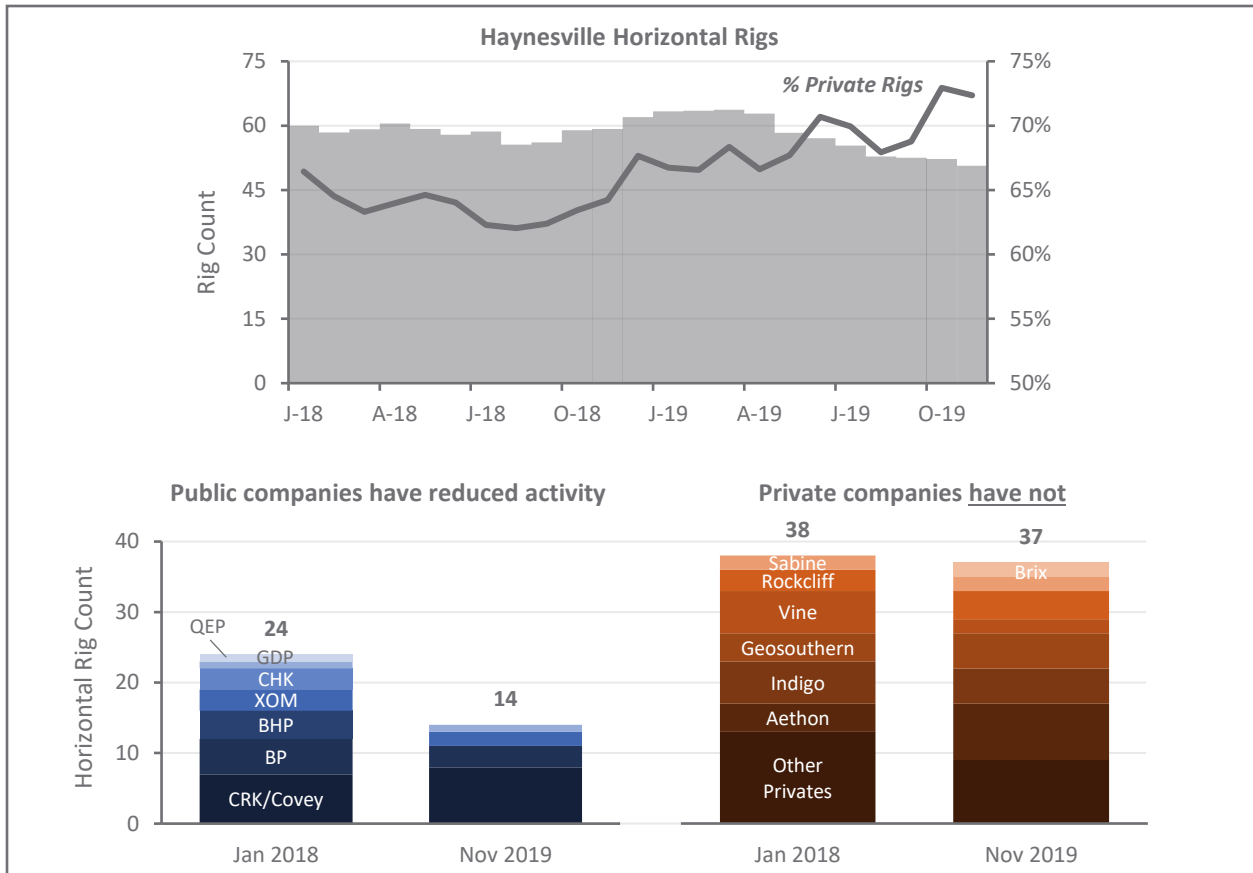
Sources: DrillingInfo, 11/1/2019; FactSet, 11/1/2019; U.S. EIA Drilling Productivity Report, 10/15/2019

In contrast to other gas basins, the rig count has remained stubbornly resilient in the Haynesville. This has led many investors to conclude that the play is highly economic and thus gain confidence that production will be robust at any price above \$2.00/mcf. The numbers tell a different story.

It is notable that while the rig count remains elevated, the same dynamic that we witnessed in the Utica is playing out in the Haynesville. Namely, **companies with other options are either slowing down drilling or have already ceased development in the basin.** On their second quarter earnings call, Chesapeake’s CEO noted:

*That leaves us with the Haynesville which, given current pricing...we have reduced that activity substantially...and forecast very low activity levels given current pricing. The economics and margins that we’re capturing from the oil investment make it difficult to see a lot of capital going back towards the Haynesville any time in the near future...Where we sit is basically a lot of strength with the Marcellus (as well).*

In addition, BP recently walked away from its drilling commitments on 100,000 acres in the Shelby Trough, one of the “core” parts of the region, due to challenging economics. While public companies have historically comprised ~45% of the rig count in the Haynesville, today they make up around 25%. On an absolute basis, public company rigs are at their lowest level since December 2016. Conversely, **rigs backed by private capital reached an all-time high in January 2019 and account for 75% of all drilling activity in the Haynesville today.**

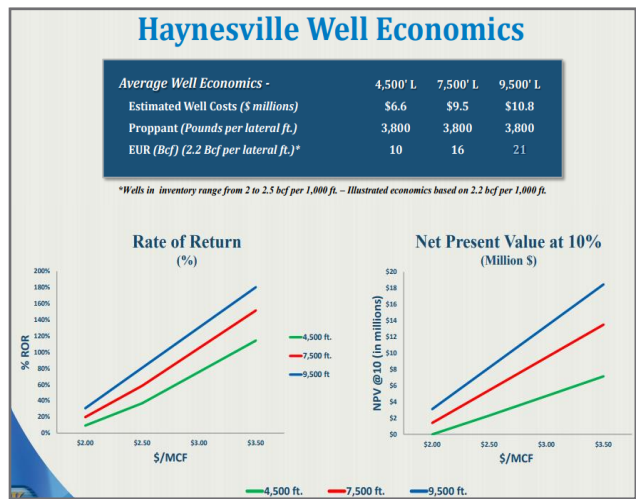


Source: DrillingInfo, 11/1/2019

Haynesville wells have very high initial production rates which can be kept stable for the first few months by constraining production, thereby reducing unit costs and keeping margins high. However, the flush production comes at a cost, namely the ensuing decline rate which is among the steepest of any unconventional play in North America. These characteristics represent two sides of the same coin – an over-pressured reservoir – whose implications are two-fold, as well.

First, simple margin analysis or even well-level economic analysis is misleading in the Haynesville. Leading operators continue to produce slides like the one shown to the right. Clearly, equity investors have never received anything remotely approaching these returns, but that is irrelevant for this discussion.

The question isn't what price is needed for a well to generate a return – the question is what price is required to keep production flat. In other words, how much cash flow do you need to fund a drilling program that can offset declines? We estimate that number to be about \$2.75/mcf in the core of the Haynesville, and over \$3.00/mcf in non-core areas.<sup>3</sup>

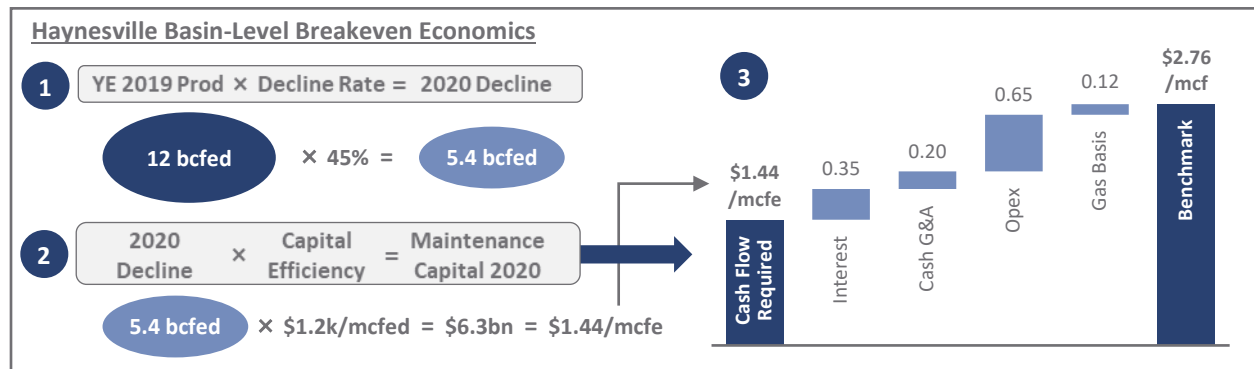


Source: Comstock Resources Corporate Presentation, 9/25/2019

<sup>3</sup> Another perspective on the capital intensity of the play is simply to note that the Haynesville currently has over 50 rigs running to produce 12 bcf/d, while the Marcellus has about 22 to produce 23 bcf/d. Perhaps that is why the public company rig count has fallen 30% since May 2019, when natural gas prices began to dip below \$2.75/mcf.



Similar to the analysis conducted for the Utica, the following table shows basin-level economics for the Haynesville Shale, using reported financial results.



Sources: Financial filings of public and private companies, 3Q 2019; SSCP analysis, 4Q 2019

**It's clear that even in the core of the basin, organic cash flows do not support maintenance capital programs in a sub-\$2.50 gas market, let alone a growth regime.**

In addition, should the rig count continue to fall, the reduction in volumes will be swift and severe. The basin has already exhibited this behavior once, when production fell from 10 bcfed in 2012 to less than 7 bcfed just one year later. Given the rapid rise in production since 2017, we estimate the Haynesville's current base decline rate to be about 45%.

If these observations are true, why hasn't the rig count corrected, and perhaps more importantly, **why have private operators consistently added rigs in 2019 despite falling gas prices?** While hedge books provide some protection, it's clear that the economics do not justify the activity. Instead, we believe that **a combination of cash flow- and PDP-related credit covenants** (liquidity is critical to maintain when depletion rates are high) **and compensation waterfall hurdles are driving capital deployment decisions.**

While equity investors appear to be misinterpreting why volumes continue to grow even as prices fall, the credit markets seem to have caught on. Comstock Resources, the most active driller in the basin, continues to outspend cash flows with less than \$250mm available on its \$1.5bn reserve-based lending facility. Comstock's unsecured bond is trading at 14+%. Vine Oil & Gas, which makes up about 10% of current basin-wide production, has a bond trading north of 40%, despite its attractive hedge position into 2021. Clearly, **investors who understand downside risk appreciate the challenges facing high-cost, capital-intensive, high-decline business models.**<sup>4</sup>

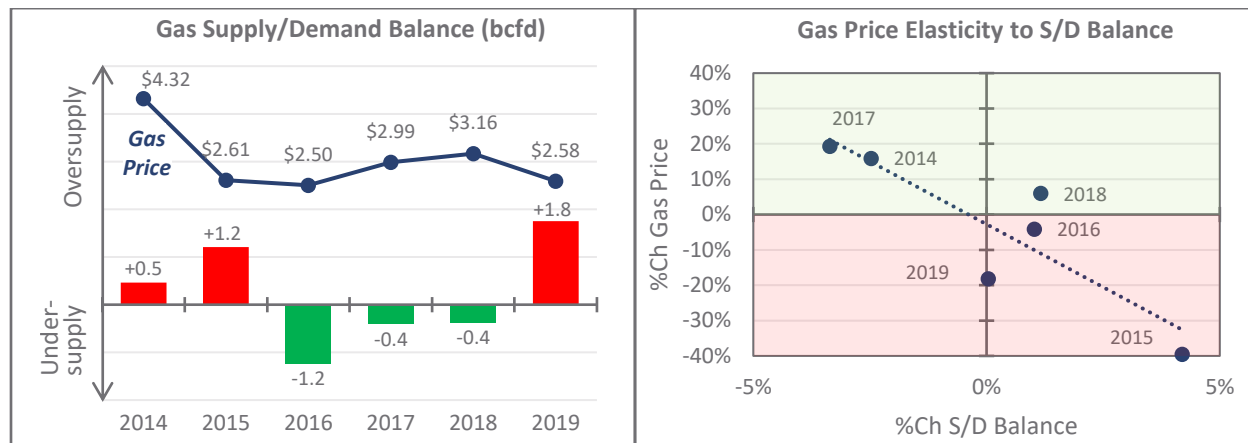
Since most natural gas supply forecasts have Utica and Haynesville volumes either flat or modestly growing, since both basins have relatively high decline rates, and since both basins are dominated by private operators with stretched balance sheets, **investors should keep a weather eye on activity levels in both the Haynesville and Utica, as the rig count will be a leading indicator in the struggle between cash flows, economics, and capital availability. The status quo is not viable at current commodity prices, and reduced activity levels will have an unavoidable impact on volumes.**

## SUMMARY

The market is clearly bearish on the prospects for both natural gas and natural gas producers. While that may have made sense from a cyclical perspective as total dry gas supply grew by almost 25% from 2017 to 2019 in a \$3.00/mcf price environment, we contend that a structurally negative view going forward is based on a misunderstanding of the sources of supply growth as well as their sustainability.

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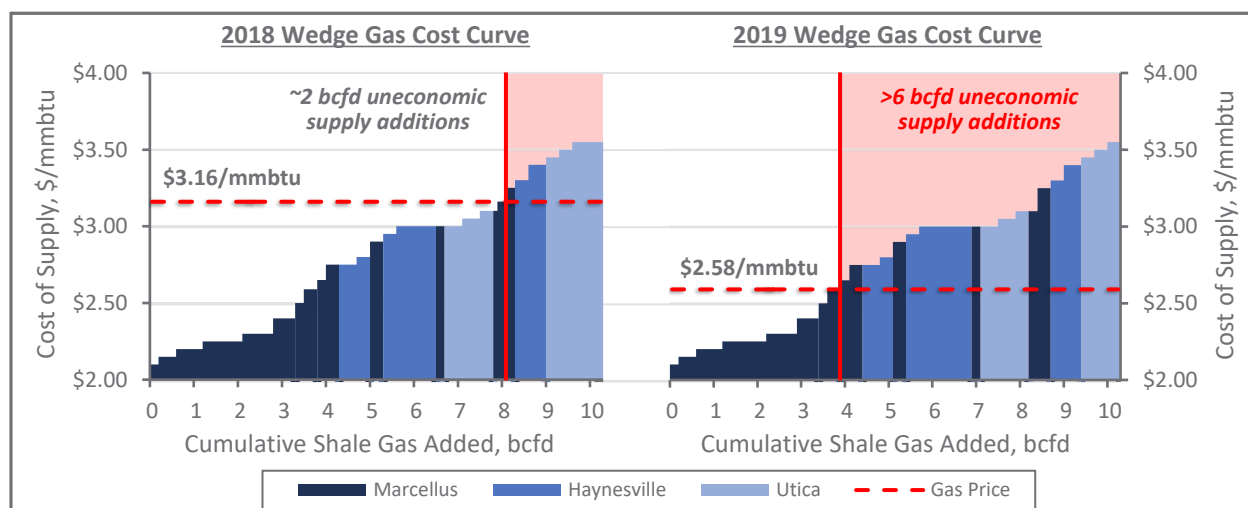
First, it should be noted that like most commodities with value-in-use, natural gas markets are generally in balance with price acting to bring supply and demand into equilibrium. As these charts show, small changes in market balances can have meaningful impacts on price.



Sources: U.S. EIA, 3Q 2019; SSCP analysis, 4Q 2019

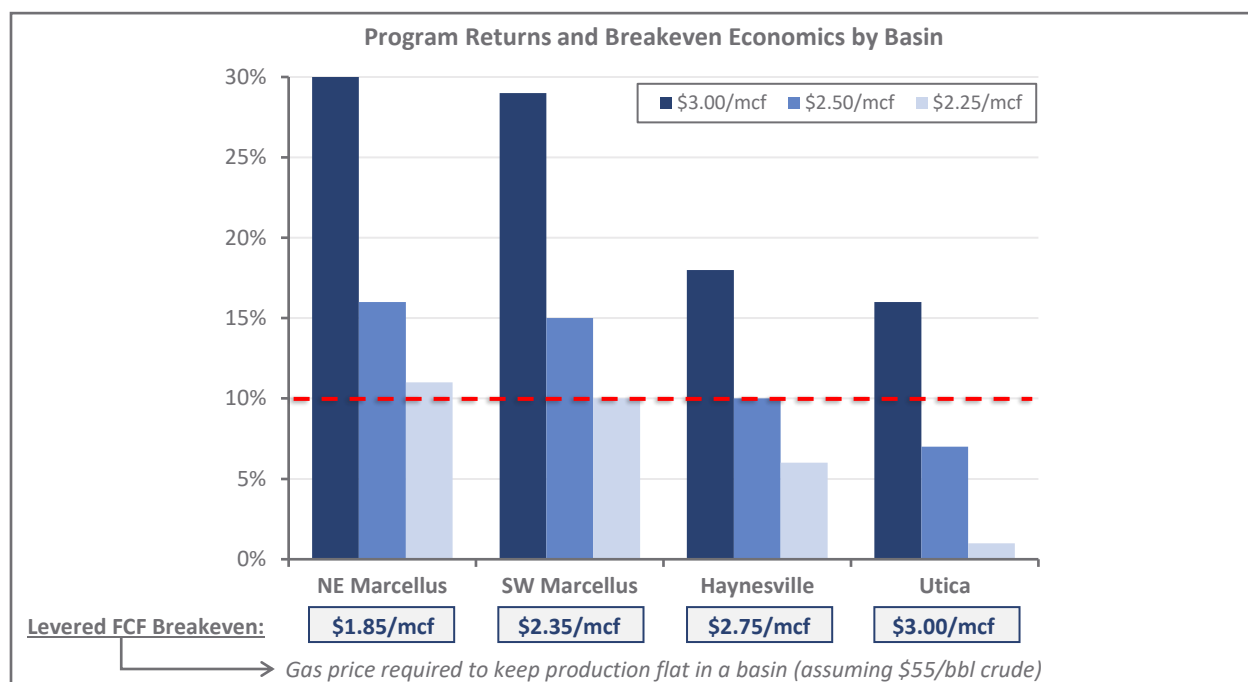
The market is oversupplied today for the first time in three years, and the commodity is playing its role to ration production. Companies are responding, as the natural gas rig count has dropped by 25% from the peak in 1Q19, closely matching the decline in the commodity. To suggest that there will be no supply impact from a decline in activity defies logic.

Second, over the past two years, net incremental volumes from the Haynesville, Utica, and SCOOP/STACK total 9.5 bcf relative to a market surplus of about 1.4 bcf over the same period. While hedges, reserve-based credit facilities, and cash flow-based bond covenants can all fund and/or incent uneconomic behavior for a period of time, they cannot do so in perpetuity. The reality is that **while Permian associated gas volumes are a rational product of the current commodity price environment, a significant portion of recent shale gas supply additions are not** – they only made sense when gas was above \$2.75/mcf, which to be fair is where natural gas markets cleared for most of the last three years.



Source: SSCP estimates, 4Q 2019

While the data above might be inconsistent with company claims and marketing decks, they are entirely consistent both with the actions of companies who have the optionality of multi-basin development programs and with a bottoms-up analysis of cash-on-cash returns and basin-level breakevens.



Sources: SSCP analysis, 4Q 2019

This analysis is further reinforced by recent comments from Cabot<sup>5</sup>, who has one of the cleanest balance sheets and highest-return acreage positions in the industry. On their third quarter call, Cabot’s CEO announced that the company was moving to a maintenance development program in a sub-\$2.50/mcf price environment as their “financial metrics [are] a priority...[and] growth...is secondary.” If the lowest-cost, least-levered natural gas producer is rationing capital and going ex-growth when prices are below \$2.50/mcf, it’s hard to accept claims of 50-100% IRR’s at similar prices from lower quality operators with a straight face.

Given how tenuous much of the recent non-Permian, non-Marcellus supply base is today, and given how sensitive natural gas prices are to small changes in supply/demand balances, we contend that the market consensus around the outlook for the commodity is far too pessimistic. Instead of obsessing about incremental pipelines and the flood of Permian gas production, **investors would be wise to watch three areas on the supply side which are already responding to a relatively short period of unsustainably low gas prices. We believe these basins will define the outlook for natural gas over the coming years:**

1. Non-Permian associated gas volumes, particularly from the SCOOP/STACK
2. Utica rig count and well completions
3. Haynesville rig count and well completions

As these trends unfold, we will report back. Stay tuned.

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