



ICF QUICK TAKE

# Marcellus Juggernaut

By Kevin Petak, Ananth Chikkatur, and Julio Manik



## Dominance of Marcellus and Utica...

As the oldest oil and gas producing area in the United States, the Appalachian Basin has made a comeback during the past decade thanks to Marcellus and Utica shale gas production. Shale gas production from the Marcellus and Utica basins now stands at roughly 20 billion cubic feet per day (Bcf/d), compared with only 2 Bcf/d in 2010—a 10-fold increase in only 5 years.

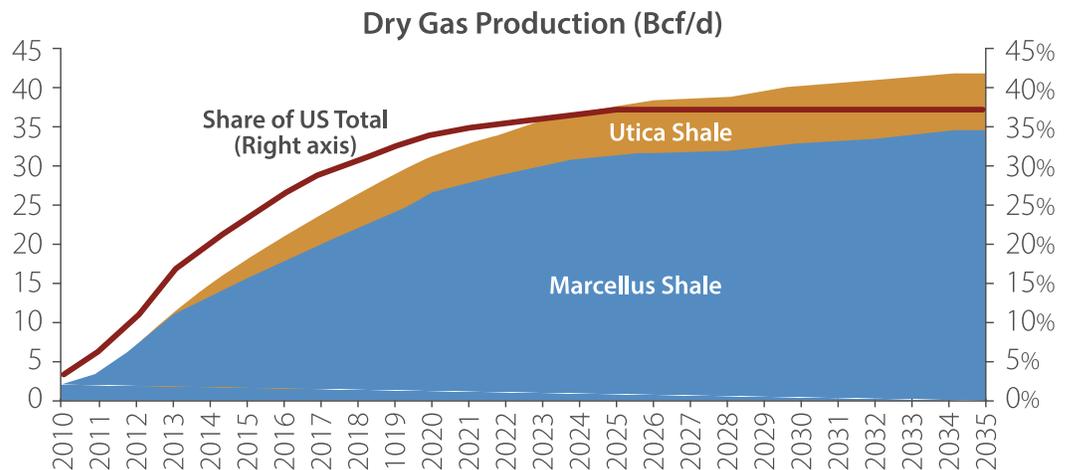
ICF projects that Marcellus and Utica production will continue to grow rapidly, rising to upwards of 35 Bcf/d by 2025 and to more than 40 Bcf/d by 2035 (Exhibit 1). In fact, Marcellus and Utica gas production is currently 25 percent of total U.S. gas production, and ICF projects that this dominance will only increase over time, with the area’s production rising to nearly 40 percent of total U.S. gas production by 2035.

## ...driven by a relatively low-cost basis...

Production in the Marcellus and Utica basins is the most cost effective in North America today. Robust development of the area has been driven by significant improvements in horizontal drilling and multifrac completion technology and is also supported by the area’s relatively large resource base. Improvements in technology have driven the estimated ultimate recovery per completion from an average of 3 Bcf in 2010 to more than 7 Bcf today.

At the same time, technology enhancements have kept drilling and completion costs in check. Such improvements, including reductions in the number of days to drill and complete wells and efficiency gains in hydraulic fracturing, have reduced completion costs by 30 percent to 40 percent over the past few years. Thus, the unit cost of the area’s production is relatively low, with most producers citing cost-effective production in the \$1 to \$2 per MMBtu range.

**Exhibit 1: Production Projections in Marcellus/Utica Shales, Compared to Total U.S. Production**

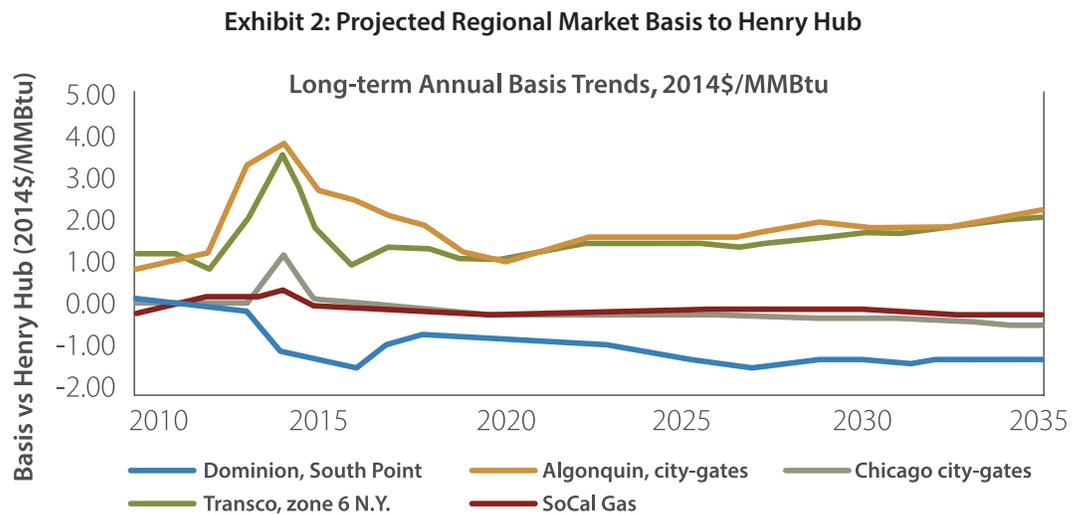


Source: ICF International



### ...making the basin a game changer for North American gas markets.

This dramatic increase in low-cost Appalachian Basin gas production has influenced the North American gas markets so much that the markets have been turned on their head during the past few years. Relationships between the area's gas prices and gas prices elsewhere have been materially altered. As shown in Exhibit 2, the price of natural gas in the Appalachian Basin (represented by the Dominion South Point price) has recently been trading at a significant discount to Henry Hub. Conversely, prices elsewhere have been trading at a premium to Henry Hub.



Source: ICF International

ICF projects that the Marcellus/Utica area's discount to Henry Hub is likely to continue despite the upcoming pipeline buildout. In addition, price impacts from the area are likely to "spill over" into other areas. For example, we see that Chicago and Ontario prices will be driven down relative to Henry Hub, as Marcellus and Utica gas continues to make its way into those markets.

Likewise, New England and New York prices, which have been the highest in North America, are likely to soften as incremental Marcellus and Utica gas enters those areas. These dynamics are here to stay and are impacting buyers and sellers of gas across the continent.

### Harnessing the Juggernaut

So, what does this all mean, and what are some of the opportunities and risks for market participants? First, the area's production will need to find markets elsewhere, and those who facilitate the delivery of the Marcellus/Utica gas production are likely to benefit handsomely from such activity. While we have more than 20 Bcf/d of production growth in our projection, we also project that roughly 20 Bcf/d of new pipeline capacity will have to be built out of the Marcellus and Utica production areas to markets elsewhere, such as the Gulf Coast, South Atlantic, and Midwest. The local market is insufficient to absorb the incremental production. However, pipeline development is not likely to occur without obstacles and challenges. Furthermore, such development will change the transport dynamics across North America, resulting in significant impacts on the asset value of existing infrastructure throughout North America. Those who are involved in the new projects would enhance the value of their infrastructure, and those who are not will be left behind.



icfi.com

©2015 ICF International, Inc.

Any views or opinions expressed in this quick take are solely those of the author(s) and do not necessarily represent those of ICF International. This quick take is provided for informational purposes only and the contents are subject to change without notice. No contractual obligations are formed directly or indirectly by this document. ICF MAKES NO WARRANTIES, EXPRESS, IMPLIED, OR STATUTORY, AS TO THE INFORMATION IN THIS DOCUMENT.

No part of this document may be reproduced or transmitted in any form, or by any means (electronic, mechanical, or otherwise), for any purpose without prior written permission.

ICF and ICF INTERNATIONAL are registered trademarks of ICF International and/or its affiliates. Other names may be trademarks of their respective owners.

### About ICF International

ICF International (NASDAQ:ICFI) provides professional services and technology solutions that deliver beneficial impact in areas critical to the world's future. ICF is fluent in the language of change, whether driven by markets, technology, or policy. Since 1969, we have combined a passion for our work with deep industry expertise to tackle our clients' most important challenges. We partner with clients around the globe—advising, executing, innovating—to help them define and achieve success. Our more than 5,000 employees serve government and commercial clients from more than 70 offices worldwide. ICF's website is [www.icfi.com](http://www.icfi.com).

Second, market evolution is paramount for producers and infrastructure developers. This is another way of saying that local market growth is insufficient to absorb the area's production. Thus, the importance of liquefied natural gas (LNG) and Mexican exports and the growth of industrial gas use and gas-fired generation elsewhere are important factors for producers and infrastructure developers. Without such market growth, Marcellus/Utica gas prices would remain depressed, and pipeline infrastructure to support gas exiting the area would eventually be decontracted, leaving producers and infrastructure developers with low or negative returns on investment.

Third, regional diversification is imperative. While the area's gas prices are low today—relative to prices elsewhere—the pendulum can always swing the other way at some point. Regional price behavior is always uncertain, emphasizing the point that producers and consumers are well served by regional diversification. Producers (including those in the Marcellus/Utica basins) would be wise to diversify into different basins to capture positive price changes elsewhere. Likewise, consumers are always well served with a diversified portfolio that doesn't rely on gas from a single basin. Such regional diversification is both a hedge against negative price changes within an area and a means to capture positive price changes elsewhere.

Fourth, gas purchasing decisions should not be made without looking at the Marcellus/Utica basins as an option. The impacts of Marcellus and Utica gas will be widespread, affecting prices across the continent. Pipeline projects will eventually move the area's molecules directly to Great Plains and South Atlantic states, perhaps even as far west as Iowa and Nebraska and as far south as Florida. Consumers of gas would be well served to rethink their current supply portfolios, as consumers in the Northeast and Mid-Atlantic (who are most directly impacted by the area's production) are already doing.

Fifth, new and yet-unforeseen gas and liquids use could be spurred by the area's production growth, and those on the forefront of such activities could stand to benefit most. There are many different types of gas use that could evolve in this market. For example, small-scale LNG applications are being pursued, most notably in rail and marine applications. Gas-based ammonia production may occur in some areas where it has not historically occurred. Ethane use in power plants could be a consideration. Gas-based distributed generation is on the drawing board for many industry planners, in part driven by broader market trends and interests. Dimethyl-ether has made its way onto the list of emerging applications along with small-scale gas-to-diesel conversion. The possibilities seem to be limited only by imagination and the willingness to take risks. Anything is fair game for a production area like the Marcellus/Utica, which is growing so robustly such that the area's producers are continuously looking for outlets for their production.

Finally, stay tuned to ICF, as we continuously investigate the issues raised in this article. The list of opportunities (and risks) keeps changing, and ICF is working with a wide spectrum of interested parties. Our studies remain at the forefront of new analyses in the Marcellus/Utica. Contact us directly if you wish to discuss any of the ideas discussed above or to suggest new items for our list.

---

For more information contact:

Kevin Petak | [kevin.petak@icfi.com](mailto:kevin.petak@icfi.com) | +1.703.218.2753  
Ananth Chikkatur | [ananth.chikkatur@icfi.com](mailto:ananth.chikkatur@icfi.com) | +1.703.218.2593  
Julio Manik | [julio.manik@icfi.com](mailto:julio.manik@icfi.com) | +1.703.934.3129

---