

## MITIGATING THE RISK OF RISING ENERGY PRICES

### Natural Gas Market Outlook for the rest of 2014

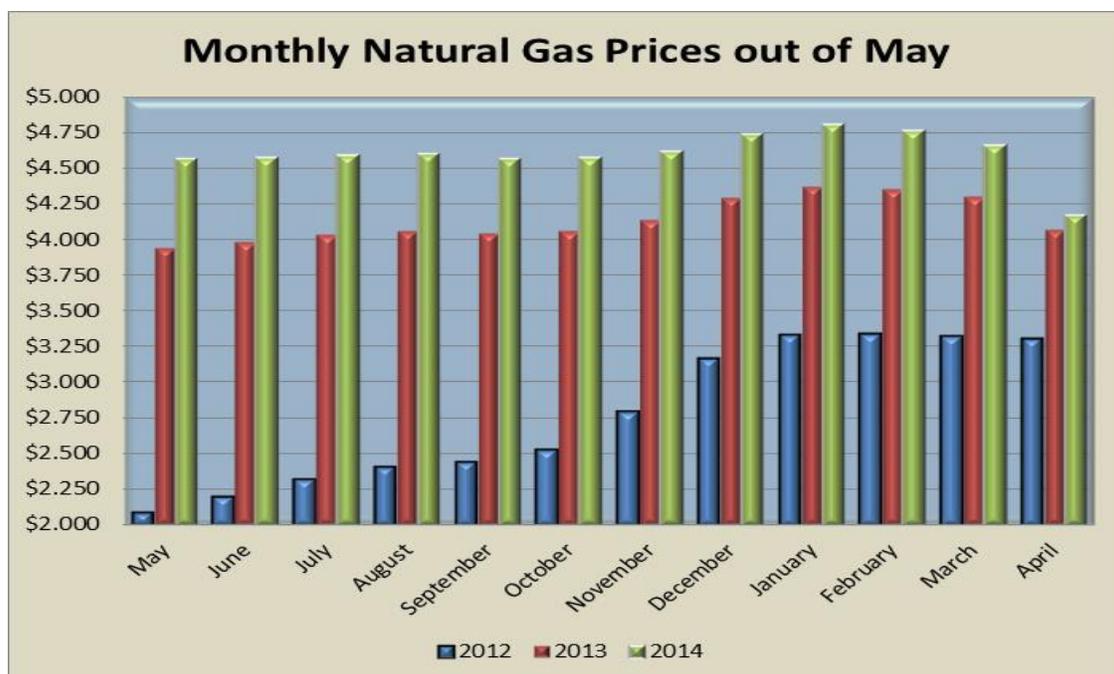
With one of the coldest winters in recent history behind us, the natural gas market is going to shift from pulling natural gas out of storage to meet demand (the “withdrawal season”) to putting natural gas in storage for the next winter (the “injection season”), a time when prices typically retreat. As of April 10, 2014, with the natural gas market trading above \$4.20/MMBtu for the next 24 months, the probability is that the natural gas market has entered a new trading range of between \$4.20-\$4.50/MMBtu for 2014 and probably for 2015 as well. These higher prices reflect an increase of 32% over 2013 and almost 75% since 2012.

The following chart shows the yearly average for natural gas prices from 2009 through the present.

Year	Yearly Average (\$/MMBtu)	Increase/(Decrease) Year over Year	% Increase/(Decrease) Year over Year
2009	\$3.986	N/A	N/A
2010	\$4.393	\$0.407	10.2%
2011	\$4.042	(\$0.351)	(8.0%)
2012	\$2.789	(\$1.253)	(31%)
2013	\$3.652	\$0.863	30.9%
2014*	\$4.851	\$1.20	32.8%

\*Through April 2014 settlement

The near term impact of the change in natural gas prices can be seen in the following graph, which compares the prompt 12 month natural gas strips as of April 4<sup>th</sup> of that year.



The significant gas price increases will not only impact natural gas costs going forward, but will also drive up electricity prices, especially in the PJM and Texas markets. In a recent report from the Energy Information Administration, 2014 natural gas prices are expected to settle at an increase of almost 20% versus 2013. From a risk management perspective, the critical question becomes where are the natural gas and electricity markets headed?

Overall, EMEX has a bullish view of the natural gas market for the next 1-3 years. While there will be market dips, EMEX believes that the current prices for natural gas are likely to persist. The following table highlights key bullish and bearish drivers for the natural gas market, with further details concerning each factor provided below.

<b>Bullish Indicators</b>	<b>Bearish Indicators</b>
Lowest Natural Gas in Storage in 11 years	Continued Use of Fracking
Shift in supply/demand dynamics	Reduction in Coal to Gas switching for Power Generation
Weather for Summer 2014	
Growth in LNG Exports	

#### **Bullish Indicators—Factors that are likely to keep pushing the market up**

1. *Low Storage Numbers Headed into Injection Season.* Historically, the winter (November-March) is known as the “withdrawal season”, meaning that natural gas is being pulled out of the ground to meet heating and power demand. The following table shows the storage numbers at the end of each withdrawal season for the past 5 years.

<b>Year</b>	<b>Total Inventory (BCF)</b>	<b>Year over Year Change</b>	<b>Percentage Change Year over Year</b>
2010	1,638	N/A	N/A
2011	1,624	-14	-0.85%
2012	2,472	848	52.2%
2013	1,687	-785	-31.8%
2014	822	-865	-51.3%

Looking even further back, this is the lowest natural gas storage numbers since 2003, which was the start of a strong 3 year run in natural gas prices, which was further fueled by hurricane activity in the Gulf.

As we move into the 2014 injection season, the EIA expects a total injection of almost 2,600 BCF, which would bring total gas in storage headed into the winter of 2014-15 to 3,422 BCF. For comparison purposes, total natural gas in storage for this past winter was 3,834 BCF. Even if the EIA projections prove to be correct, natural gas in storage will be over 10% below last year and almost 13% below the 2012 levels. In other words, there will be less natural gas in storage than in the past 2 years, putting upward pressure on natural gas prices not only for the balance of this year, but also for Winter 2014-2015.

2. *Shift in supply/demand dynamics.* The impact of the increased use of natural gas for power generation has been significant. From 2008 through 2013, usage for generation has increased almost 25%. By comparison, total production is up only 11.5%. In other words, growth in demand for power generation is outpacing supply growth. This will provide support to the current natural gas prices and could push the market up even higher. With over 20,000 MW of coal fired generation expected to retire by the end of the decade, the growth in usage of natural gas for power generation is likely to continue its steep upward trajectory, putting additional pressure on supply and supporting the current natural gas market price levels.
3. *Weather patterns for Summer 2014.* The impact of the brutally cold 2013-14 winter pushed the natural gas market up significantly. The summer outlook does not look like it is likely to provide much relief as more natural gas will be needed for power generation. The summer 2014 forecast calls for hot and dry temperatures in Texas and the Northeast with hot and wet weather dominating the Mid-Atlantic regions, with California expected to have a normal summer in terms of heat. With 3 of the 4 major population centers which rely heavily on natural gas fired generation expecting hot summers, consumption of natural gas is likely to remain high this summer, creating tension between the need for gas for power generation and putting gas into storage for next winter.

In addition, the Summer 2014 weather forecast calls for at least one major hurricane in the Gulf of Mexico, coming ashore somewhere along the Gulf Coast. If this prediction comes to pass, it will provide further support to natural gas prices as both supply and processing facilities in the Gulf would be disrupted.

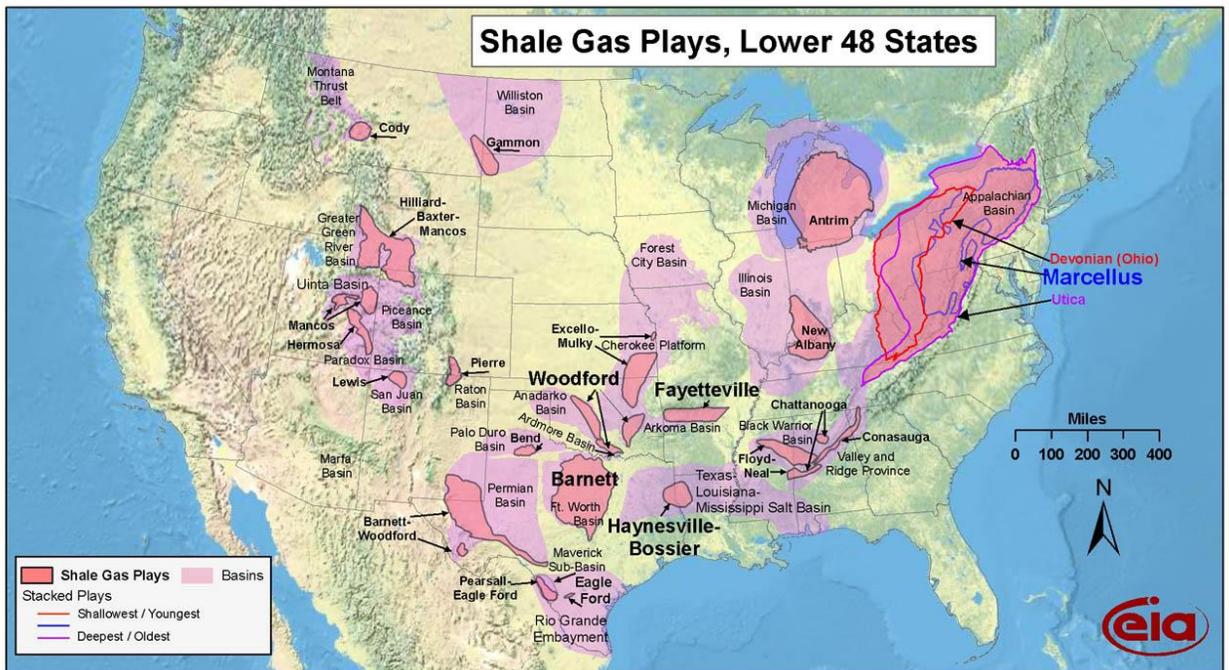
4. *Liquefied Natural Gas Exports.* With the boom in shale gas production in the U.S., there has been a move for the U.S. to shift from an importer to an exporter of natural gas through liquefied natural gas. As of April 1, 2014, 7 export terminals have received approval from both the Federal Energy Regulatory Commission (FERC) and the Department of Energy (DOE) with a total capacity of almost 13 BCF/day. Given that the EIA projects net production for the next several years to be between 77-80 BCF/day during the injection season, the impact of LNG exports will reduce natural gas available for domestic consumption by over 15%.

This, of course, assumes no increase in LNG export capacity. However, this presumption is likely incorrect. Looking at the additional LNG terminals already approved by FERC, the total export capacity for LNG terminals is likely to exceed 30 BCF a day, an increase of almost 200% above current levels. While not all of these terminals will likely be built, LNG exports could easily climb to approximately 20 BCF/day, further reducing natural gas supplies available for domestic consumption and providing price support for natural gas and electricity.

**Bearish Indicators—factors that are likely to reduce natural gas prices**

While all of the factors listed above will provide support to the natural gas market, there are several factors which could off-set the bullish market signals above.

1. *Increased production due to fracking.* One of the major reasons that natural gas prices have fallen over the past several years is the increased use of fracking to reach natural gas deposits which were previously unavailable. With the discovery of massive shale deposits across vast areas of the country, including the Marcellus/Utica Shale in the Mid-Atlantic, the Bakken Shale in the Dakotas, and the Eagle Ford Shale in Texas, there are ample supplies of natural gas to meet future needs. In fact, the Marcellus Shale alone supplies almost 20% of current domestic consumption. Below is a map showing the location of major shale formations in the U.S.



In fact, production from the shale deposits has actually more than off-set domestic production declines from traditional natural gas sources, such as the Gulf Coast. According to BP's 2014 energy outlook, shale gas production will increase by roughly 3.4% per year, outpacing consumption increases and providing a net growth in total supply.

2. *Decrease in coal displacement.* As mentioned above, the use of natural gas for power generation has grown significantly and has actually outpaced supply growth on a percentage basis. However, with increasing natural gas prices, the displacement of coal fired generation by natural gas generation is likely to decrease as coal once again becomes a cheaper source for electricity. Given current natural gas prices and projections of future natural gas prices, the percentage of electricity generated by coal will increase from a low of 37% in 2012 (when gas prices were the lowest in the past decade) to 40% of total production in 2014. This increased

use of coal for power generation, even accounting for the closure of many coal fired power plants, could decrease the demand for natural gas, thereby putting downward pressure on natural gas prices going forward.

## **Conclusions**

There is no argument that both natural gas production and consumption have increased over the past several years. The boom in production has been fueled by increased fracking, resulting in natural gas recovery from previously inaccessible sources. This initial jolt to supply spurred a move towards increased use of natural gas for power generation as lower costs made natural gas fired power plants extremely price competitive.

However, with the extreme cold in the winter of 2013-2014, natural gas prices have rebounded to levels not seen since 2009. The question becomes whether natural gas has entered a new trading range or is this just a temporary price spike before gas retreats back to the mid-to-low \$3/MMBtu range. Looking at the fundamental signals for both demand and supply suggests the market has found a new trading range that will likely be sustained for the next several years. This new price range is projected to hover around \$4.50/MMBtu. In other words, the era of low natural gas and power prices appears to be coming to an end, leading to higher energy costs that will need to be effectively managed for large end users.

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