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ERIK NORLAND, SENIOR ECONOMIST AND EXECUTIVE DIRECTOR
CME GROUP

25 AUGUST 2016

Natural Gas: Upside and Downside Risks as La Niña Looms

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Last October, we published a paper titled **Upside and Downside Risks to Natural Gas Prices** that reached the following conclusions:

- The bear market in natural gas prices could end relatively soon.
- In the short term, natural gas prices could remain under downward pressure, especially if El Niño produces a warmer-than-normal winter in the northern United States, and Canada.
- Natural gas futures and options may be much too complacent regarding the possibility of prices spiking in 2016 and 2017.
- Natural gas supply might not be able to continue growing at the present pace given the impact of low natural gas and crude oil prices on capital expenditure.
- Long-term U.S. domestic demand for natural gas will almost certainly continue to rise even if it is temporarily depressed by El Niño.
- LNG exports will work only when prices remain low but could put a floor under the U.S. price.
- Natural gas price spikes of up to $10+ per mmBtu are not the central scenario but cannot be ruled out.

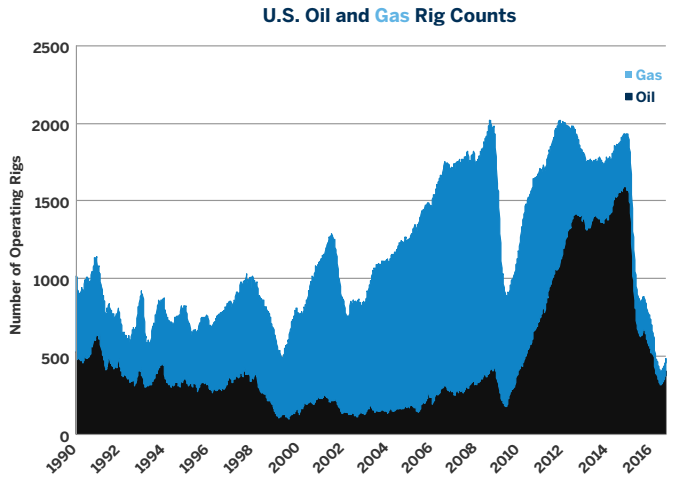
In the past 10 months, many of these assumptions have been borne out. First, an exceptionally mild El Niño winter pushed prices down to as low as $1.61 per mmBtu, the lowest since the winter of 1998-99. Since hitting bottom in March, prices nearly doubled to $3.00 per mmBtu before settling into a range from $2.50 to $3.00. While increased electricity demand due to an exceptionally warm post-El Niño summer in much of North America undoubtedly contributed to the rebound in prices, the other factors mentioned above are also at play: natural gas production is contracting, and there is a secular trend towards increased electricity demand that is independent of the El Niño/La Niña cycle.

As such, while we think that the case for higher natural gas prices is much less one sided now than it was a few months ago, the fundamental forces driving them higher are still very much in place. That said, downside risks remain, including still burgeoning storage levels and the possibility that the coming winter might not be as cold in North America as the budding La Niña might suggest.

Supply: No growth

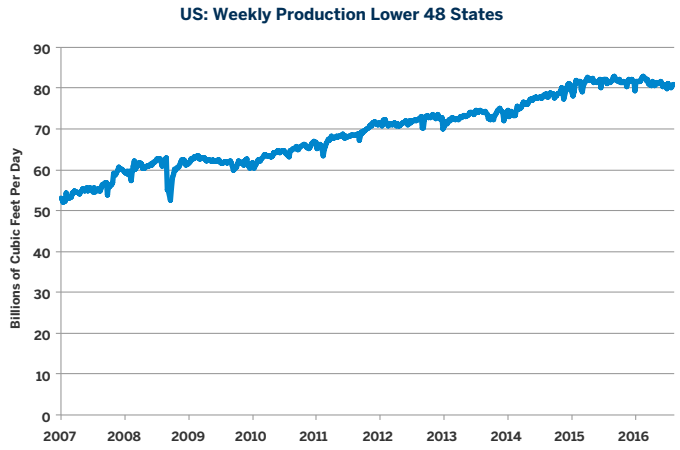
After years of depressed natural gas prices combined with the recent drop in crude oil prices that began in earnest in late 2014, investment in natural gas drilling has all but dried up (Figure 1), and indeed natural gas production in the U.S. has begun to stagnate.

Figure 1: Investment Remains in the Doldrums After the Collapse in Rig Counts



Source: Bloomberg Professional, Baker Hughes (BAKEOIL and BAKEGAS)

Figure 2: Production of Natural Gas has Begun to Stagnate, Even Declining Slightly



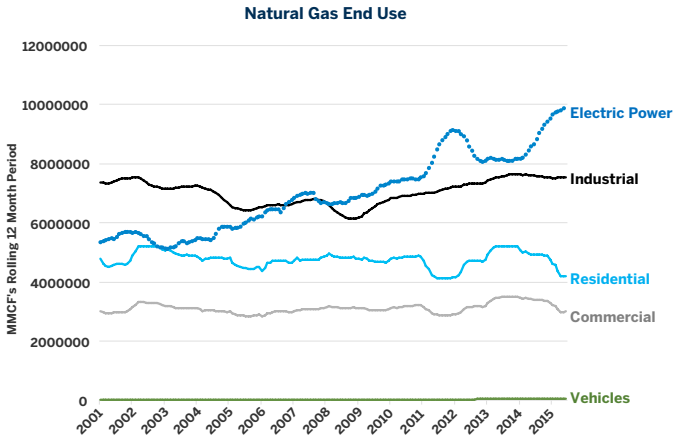
Source: Bloomberg Professional (NAGSLOWR)

The recovery in natural gas and crude oil prices this spring did bring a few rigs back online but prices have been sliding again so far this summer and it's not clear if U.S. natural gas production can keep growing. The recent opening up of Mexico to more foreign investment in the oil and gas sector has the potential to boost the country's output but significant barriers remain in place, and at current prices it's not likely that Mexican production is about to boom. (Please see our article **"Mexico on the Cusp of an Energy Revolution"** for details). Stagnant or declining production would not imply higher prices if demand growth was to weaken, but signs are that demand growth will continue to pick up.

Demand: Still positioned for growth

On the demand side of the equation, electricity generation from natural gas continues to rise. Residential and commercial use dipped over the usually mild 2015-16 winter, but will probably recover later this year, especially if the coming winter turns out to be colder than normal (Figure 3).

Figure 3: Electrical Power Generation From Natural Gas Continues to Rise



Source: Energy Information Administration

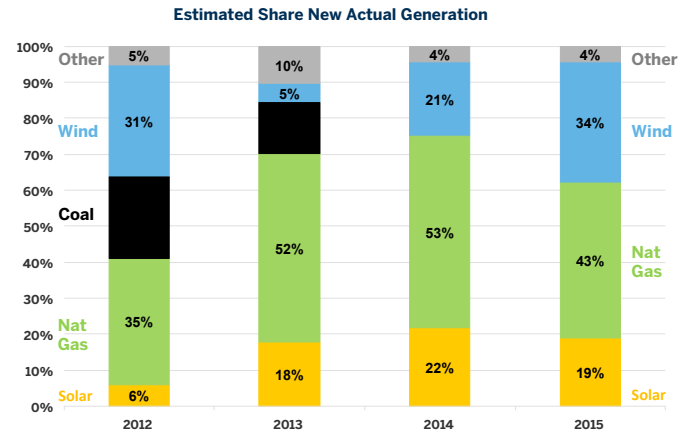
Electricity demand is likely to continue rising for two reasons:

1) There has been no new coal power generation facility brought online since 2013, leaving natural gas, wind, and solar as the primary replacements (Figure 4).

2) Natural gas capacity factors have been increasing while coal capacity factors have been declining. Essentially, this means that natural gas power plants are operating more of the time than coal power plants for the first time (Figure 5).

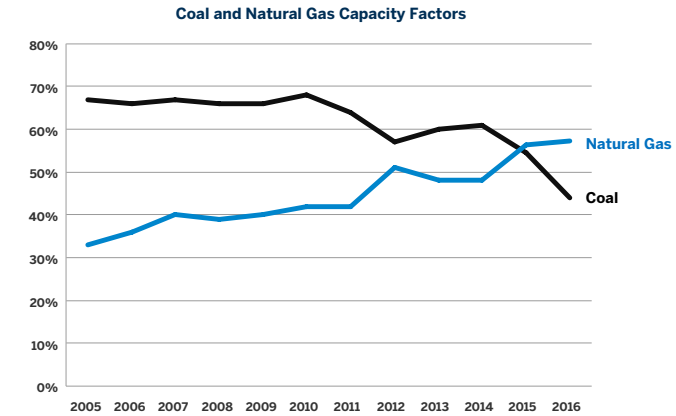
Basically, not only is natural gas increasing its share of the power generating capacity, a greater share of the natural gas generating capacity is actually in use at any given time.

Figure 4: Natural Gas has Displaced Coal to be the Largest Share of New Generating Capacity



Source: Solar Market Insight Report 2014 Q4 | Solar Energy Industries Association, EIA

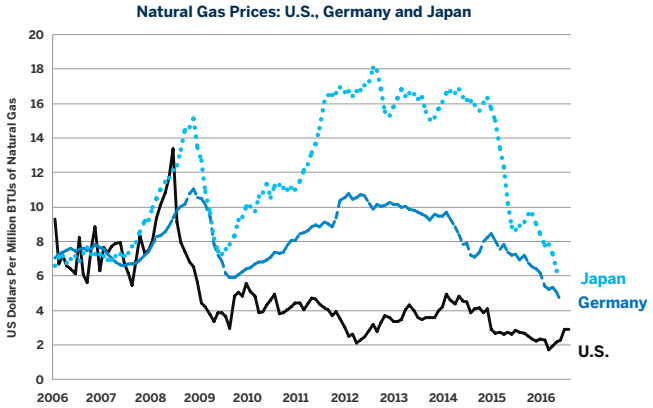
Figure 5: Natural Gas Power Plants Now Operate at Higher Capacity Than Coal



Source: EIA Electric Power Monthly (2016 data estimated from first five months)

With the Chenière Sabine Pass facility now actively exporting natural gas, it opens an additional avenue for foreign demand – in addition to Canada and Mexico. Chenière capacity theoretically is around 2% of U.S. production per day, but in actuality operates at far below its theoretical maximum. The bad news for natural gas exports in the short-run is that the spread between the U.S. and the international price has collapsed (Figure 6). If this moves back in the other direction, or if more facilities come online, LNG export could put a floor under U.S. prices. In the meantime, the possibility of LNG exports will likely have only a modest impact upon the U.S. price.

Figure 6: Natural Gas Spreads Have Collapsed

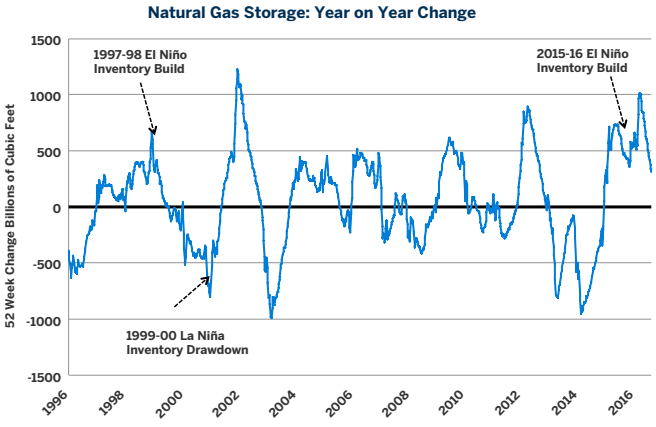


Source: Bloomberg Professional (NG1, NGIMGEP2 and LNGJLNJP)

Inelastic but buffered by high storage levels

Both natural gas supply and demand are highly inelastic in the short-term. This can give rise to wide price swings for comparatively small changes in supply and demand. For example, natural gas prices rallied from $1.60 per mmBtu in February 1999 to nearly $10 by December 2000. They spent the next decade ranging from $2 to $16 per mmBtu. While the potential for enormous moves of this scale remains, one factor that may buffer the natural gas market in the short-term is storage. Storage levels remain at seasonally adjusted record levels, and year-on-year storage has continued to increase (Figure 7).

Figure 7: Storage Levels Continue to Rise but at a Diminishing Pace



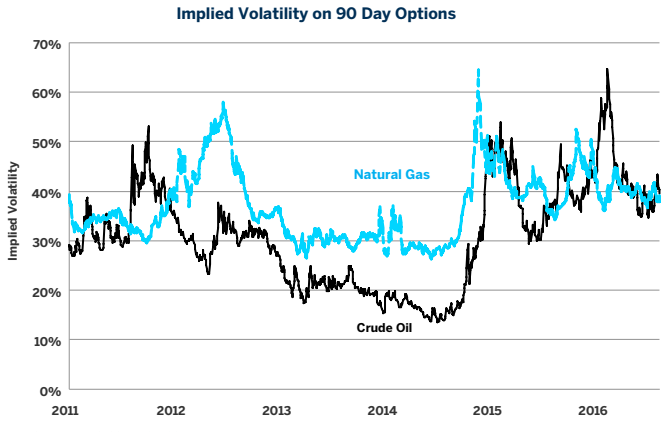
Source: Bloomberg Professional (NG1, NGIMGEP2 and LNGJLNJP)

Pricing complacency

What is remarkable about natural gas pricing is its complacency. The October 2017 natural gas futures contract is priced at only 40 cents higher than the October 2016 contract at the time of this writing. The October 2018 contract is priced halfway between those two. Basically, the natural gas forward curve prices little in the way of price movement for the next few years. Perhaps the possibility that gas rigs can be brought rapidly back online will keep a lid on U.S. prices. High storage levels will also take a while to work off, although a La Niña winter holds the potential to do that in a hurry. Given the stagnating supply and the strong likelihood of continued growth in demand, we find it surprising that the natural gas futures curve isn't reflecting a steeper contango.

The options market is also strangely complacent. The cost of natural gas options is by no means at historic lows, but options prices are near the lower end of their 2015-16 range. The same is not the case for crude oil, which is more towards the middle-to-high-end of its range (Figure 8). Part of the reason may have to do with the rebound in natural gas prices from $1.60 to above $2.50. It's also possible that the aforementioned factors of supply ramping up quickly in the event of a price spike and high levels of inventory potentially dampening price moves, might also be holding implied volatility on options down.

Figure 8: Do Natural Gas Options Price the Full Extent of Potential Volatility?



Source: Quikstrike (LO_90 and ON_90)

Bottom line

- **U.S. natural gas production is stagnating and will likely continue to do so for the foreseeable future, and might even decline slightly.**
- **Demand for natural gas continues to grow in the U.S. and Mexico, especially for electricity generation.**
- **LNG export demand is likely to be soft in the short term but has long-term potential.**
- **Storage levels are extremely high and may limit upside moves.**
- **A strong La Niña could produce a colder-than-normal winter that depletes storage levels.**
- **Pricing for natural gas is fairly complacent, with a flat forward curve and average-to-somewhat-below-average implied volatility.**

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