

### **OVERVIEW AND CONCLUSION**

Over the winter 2013-14 time horizon, assuming normal weather and moderate American economic growth, the natural gas trend probably remains sideways (NYMEX nearest futures continuation). The broad range for natural gas stands from roughly 280/310 to 490/520. Many players view “around 350” as a near term equilibrium price. The 5/1/13 summit at 444 also represents important resistance.

Calendar 2014 US natural gas consumption falls about .8 percent to 69.6bcf/day from 2013’s roughly 70.1bcf/d. In contrast, the EIA predicts 2014 total marketed production climbs 1.1pc year-on-year from 70.3bcf/day to 71.0bcf/d. Slumping demand alongside growing supply in calendar 2014, if this occurs, is an important bearish consideration. See the Energy Information Administration’s (“EIA”) “Short-Term Energy Outlook” (“STEO”, Table 5a; 11/13/13, next release 12/10/13).

What does the US lower 48 states working gas inventory picture unveil regarding potential price moves? Much depends on the perspective embraced regarding what constitutes average (appropriate, normal, reasonable, typical, usual) inventory levels. One factor in this regard is the historical time horizon selected. And although arithmetic inventory totals are important, observers especially should focus on the days of inventory coverage variable. After all, changing consumption levels influence industry viewpoints regarding what constitutes average, high, or low stockpiles.

Although the long run 1990-2012 vista should not be overlooked, suppose the 2006-12 horizon is more relevant for inventory analysis. Then end October 2013 natural gas inventories, despite being high in arithmetical (bcf) terms, arguably are slightly below average. Admittedly this conclusion probably is not a mainstream view. After all, most players and soothsayers devote their attention to arithmetic rather than days coverage history. In addition, assuming normal weather, natural gas stocks at the end winter 2013/14 draw season probably will be only slightly high relative to average in days coverage terms rather than moderately above average. Given this greater emphasis on the 2006-12 era, and despite the bearish supply/demand outlook for full year 2014, prices should hold above the 280/310 support band, with a test of 400 unsurprising.

With the 2006-present days coverage perspective in mind, given end build season 2013 inventories, what are price prospects if this winter is notably colder or warmer than average? A sustained move over 400 probably requires a somewhat colder than average winter (or widespread faith that such temperatures will occur). To challenge spring 2013’s top, probably a significantly colder than normal winter is necessary. But what if major inventory drawdowns in days coverage terms occur? The marketplace could climb toward and even briefly venture north of 490/520. Conversely, to sustain moves under the 280/310 floor, warmer than usual US temperatures in the key consumption regions must emerge and continue. Important support exists around the 305/310 first quarter 2013 level; note the 313 trough on 8/8/13 following the 5/1/13 peak.

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For additional supply/demand considerations, detailed support and resistance levels, and a perspective on calendar timing considerations for eventual important tops and bottoms, see earlier

essays. (“US Natural Gas Price Architecture”, 7/11/13; “US Natural Gas Trends: Bottled Up”, 9/30/13; “US Natural Gas: the Outer Limits”; 10-21-13).

### **DRAWING CONCLUSIONS**

US (lower 48 states) natural gas inventory as of 11/15/13 is 3789bcf, down 2.3 percent from 3678bcf one year ago. The widely-watched five year average for total stocks is 3774bcf, so the current nationwide level inches up .4pc relative to that. The 2013 build season peak (April-October/early November) peak was 11/8/13 at 3834bcf, down about 2.4 percent from 2012’s 3929bcf plateau, which was touched a bit earlier (11/2/12) than 2013’s.

The EIA’s November 2013 STEO estimates end October 2013 inventory at 3810bcf. It forecasts end March 2014 stocks of 1882bcf. Relative to calendar 2013 average daily demand of 70.13bcf/day, end October inventories are 54.3 days of coverage (3810bcf/70.13bcf), with March 2014’s 26.8 days.

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The first two columns in the table below display the long run historical average (1990 through 2012) for United States working natural gas inventories at end build season (end October) and the subsequent finish of winter draw season (end March). The calendar year designated in the table (and in general for historical references elsewhere in the essay) for any given March (or a January or February) incorporates (uses) the year of the preceding October. So the 2477bcf inventory and 37.1 days of coverage existing in March 2012 (and part of the winter 2011-12 season) are indicated as belonging to 2011. The four columns beneath it detail highs and lows at end October and end March over this over two decade span.

	<b>Long Run (1990-2012)</b>	<b>Long Run (1990-present)</b>		
	<b>End Calendar Month</b>	<b>End Calendar Month</b>		
	<b>Arithmetic (Bcf)</b>	<b>Days Coverage</b>		
	<b><u>Average</u></b>	<b><u>Average</u></b>		
<b><u>October</u></b>	3282	53.8		
<b><u>March</u></b>	1359	22.3		
			<b><u>Season Highs (Year)</u></b>	<b><u>Season Lows (Year)</u></b>
	<b><u>(Bcf)</u></b>	<b><u>Days Cover</u></b>	<b><u>(Bcf)</u></b>	<b><u>Days Cover</u></b>
<b><u>October</u></b>	3930 (2012)	66.0 (1990)	2732 (2000)	42.9 (2000)
	3851 (2010)	60.7 (2009)	2810 (1996)	45.5 (1996)
<b><u>March</u></b>	2477 (2011)	37.1 (2011)	730 (2002)	11.6 (2002)
	1692 (2005)	28.1 (2005)	742 (2000)	11.6 (2000)

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What about long run averages for other winter season months? The end November days coverage average from 1990-2012 is 52.1 days, with December at 44.2 days. January averages 33.2 days, with February 25.3 days.

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Most marketplace observers focus their attention on arithmetic (bcf) working gas inventory levels, which for any given calendar month obviously have varied significantly over the years. Yet marketplace sentinels also should underscore the wide historic range from the days coverage viewpoint. For example, compare the difference between end October's days coverage ceiling and floor. The chronicle for end March days coverage likewise shows a significant expanse. Since natural gas consumption fluctuates over time, days coverage for a given arithmetic inventory level can shift accordingly, sometimes dramatically. Rising demand (as over the calendar year 2006-13 span, from 59.4bcf/day to 70.1bcf/d) reduces days coverage for any given inventory total. Calendar year 2010's 66.0bcf/day consumption (and that of the following years) leaped over the 2000's consumption top of 63.8bcf/day. October 2012's 56.4 days coverage, despite the bulky 3930bcf stockpile, stood well beneath prior summits.

Several years saw slight additional builds into calendar November. Inventory draws can extend into calendar April.

Those reviewing the distant past may insert March 1990's 1912bcf into the table. End March 2011's 37.1 days pierced March 1990's ancient 36.4 day roof. March 2012 (the March of draw season 2012-13) natural gas stocks were 1724bcf (about 750bcf less than the prior year end March) and 24.7 days.

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The average days coverage for the seven years from 2006 through 2012 (winter 2012-13), however, has ascended relative to this long run 1990-present average. This suggests that the desired level for inventory stocks has increased. Arguably this is partly due to the growing amount of alternative "investment" (buying and holding for some version of the long run) in commodities over these past several years.

Alternative investment reduces "free supply", although gurus can quarrel as to how much. CFTC Index Trader statistics for various American agricultural commodities began at end 2006. Since then, the net long positions of "Index Traders", noncommercial buy-and-hold for the long run participants, has averaged nearly twenty-five percent of total open interest. Although the CFTC does not produce Index Trader statistics for the energy complex (or base or precious metals), one should presume that Index Traders probably equal at least twenty percent of total open interest in the benchmark NYMEX and ICE contract. After all, energy (petroleum and natural gas) are members of important broad commodity indices such as the S+P Goldman Sachs Commodity Index and the Dow Jones-UBS Commodity Index. Twenty percent is not trivial.

What is a consequence of lower free supply (a fall in readily available inventories)? In order to boost available inventories to desired levels and thereby compensate for the lower effective level of days coverage, the natural gas industry will add arithmetic inventory. Thus, all else equal, the average (desired, reasonable) days coverage level (as in the 2006-present span) will rise, as the "2006 to 2012 Picture" suggests.

The natural gas industry, taking advantage of growing production and increasing demand trends in recent years (the general trend of 2006-2013) has built pipelines and expanded gas storage capacity. Increasing arithmetic inventories and higher average days coverage over the past several years to some extent may reflect these intertwined factors. Also, perhaps a desire to mitigate the potential for (risks of) seasonal natural gas price swings (or gas supply shortfalls at peak demand periods) partly may account for the rise in days coverage over the 2006-present epoch.

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Based on EIA statistics, let's do some figuring and survey days coverage for the October through March months for the past seven winter seasons, from 2006-07 through 2012-13.

**The 2006 to 2012 Picture: Average End Month Days Coverage for Calendar Month**

<u>October</u>	<u>November</u>	<u>December</u>	<u>January</u>	<u>February</u>	<u>March</u>
57.2 days	56.4	48.5	37.2	28.3	26.4 days

**Monthly Differences in Average Days Coverage: 2006-12 versus the Long Run of 1990-2012**

For example, end October's 57.2 days coverage for 2006-12 minus 1990-2012's 53.8 days equals 3.4 days.

<u>October</u>	<u>November</u>	<u>December</u>	<u>January</u>	<u>February</u>	<u>March</u>
3.4 days	4.3	4.3	4.0	3.0	4.1 days

Each calendar month manifests a noteworthy increase for the 2006-2012 period relative to the 1990-2012 long run history. The average boost for these six calendar months runs from 3.0 to 4.3 days, with the average end month expanding about 3.8 days.

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Assume the increases in days coverage shown in the seven years of the 2006-12 natural gas marketplace canvas creates a "new normal" (or at least a reasonable guideline) for US days coverage for this winter and thereafter. This shift has price implications for a given level of arithmetic inventory. What do the November 2013 STEO bcf gas inventory estimates for end October 2013 and end March 2014 indicate regarding the days coverage level for those months in relation to the 2006-12 and 1990-2012 averages?

End October 2013's 54.3 days coverage (despite the rather high stocks of 3810bcf from the arithmetic perspective) are 2.9 days beneath the 2006-12 average of 57.2 days. This is mildly bullish. In contrast, October 2013's 54.3 slightly exceeds the long run vantage point's 53.8 days.

March 2014's 26.8 days of anticipated days coverage is only .4 days over 2006-12's 26.4 day end March historical average. This sketches a much different picture from the bearish appearance derived via a comparison relative to the long run average; 26.8 days surpasses the long run end March 22.3 day average by 4.5 days.

From the days coverage perspective based upon the 2006-12 period, the October 2013 level is arguably slightly bullish, though it becomes less so by end March 2014. Relative to the 1990-12 chronicle, the roughly neutral situation in October 2013 becomes a moderately bearish one in March 2014.

The issue, of course, is which historical span should carry the most analytical weight. Answers to this are not definitive. In any event, for natural gas theatergoers inclined to compromise and combine the two perspectives, end October 2013 inventories (and current ones) probably are about average.

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The extent and timing (and speed) of inventory drawdowns will play a key role in the natural gas price level and its important trends (whether bullish, bearish, or sideways) for this winter and at

least a few months thereafter. History paints a very spacious panorama of arithmetic and days coverage draws during winter. Days coverage changes are particularly important to monitor.

For this overview, the start of draw season is represented by an end October start date even though some years evidenced stock builds into calendar November. For the 1990-winter 2012/13 period, the end October to end March average arithmetic draw was 1924bcf. That from 2006-winter 2012/13 was about 1979bcf. The small draw during the very mild winter of 2011-12 obviously significantly affects the recent 2006-12 time horizon's average. Anyway, if inventories draw this winter by 1979bcf, end March 2014 stocks will be around 1831bcf (3810-1979bcf). Compare the EIA's 1882bcf STEO estimate for 1Q14.

The average draw in days coverage terms over that 1990-winter 2012-13 duration is 31.5 days. The "normal" draw over the seven year 2006 to present period in days coverage terms is about 30.7 days, almost the same as the long run average of 31.5 days; this similarity in days coverage draws underlines the merit of the days coverage approach to natural gas inventory analysis.

The avenues for these US natural gas draw season ranges are very wide. In arithmetic terms, compare the mammoth draws of 2386bcf (2002) and 2299bcf (2007; 2010 saw 2274bcf) with the puny tumbles of 2011 (1327bcf) and 2005 (1502bcf). What does history reveal regarding monumental days coverage draws? That of 1992 was around 39.7 days, with 2002's 37.8 days and 2007's 36.3 days. What about the other extreme? The pitiful 2011 drawdown of only 19.9 days established a new record, decisively undercutting 2005's 24.9 day performance.

Recall that end October 2013 days coverage stood at about 54.3 days. What are potential ranges for US natural gas days coverage at end March 2014 derived from average, high, and low levels? For the average scenario, 54.3 days less 31.5 days (using the long run average) gives 22.8 days. This falls far beneath the stratospheric inventory for "March 2011" (actual calendar March 2012 in the winter draw span from October 2011 through March 2012) of 37.1 days). It also represents less than March 2012's (winter 2012-13) 24.7 days. The 22.8 days at end March 2014 will slightly exceed the long run end March average of 22.3 days. However, it will slide about 3.6 days beneath the 26.4 day benchmark for the seven years of 2006-12. So if the 2006-12 framework for days coverage is more appropriate than the long run one for indicating "reasonable" (average, normal) days coverage nowadays, that 31.5 day reduction (or even the 30.7 one of the 2006-12 era) generates a bullish picture.

Suppose a very bullish scene on the inventory vista evolves, with US winter 2013-14 sustaining a freeze of the East and other important consuming territories. Concentrate on the days coverage variable. The gigantic draws of the 1992, 2002, and 2007 winters average out to about a 37.9 day inventory slash. Subtract this from October 2013's 54.3 days of demand. Days coverage at end March 2014 would then melt down to 16.4 days. This would not match the lows of 2002 and 2000's 11.6 days (compare 2003's 17.3 days). However, 16.4 days at end 1Q14 nevertheless would be way below average, regardless of whether one embraced the 1990-present or the 2006-present viewpoint.

Alternatively, suppose America's upcoming winter weather is balmy. For that bearish picture, first choose draw year 2005's very modest contraction, 24.9 days. That leaves end 1Q14 stocks at a hefty 29.4 days (54.3 less 24.9 days). A reprise of 2011's meager 19.9 day reduction leaves gigantic March 2014 supplies of 34.4 days coverage.

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Watch natural gas price levels and trends in distant months and years, not only those of nearest futures continuation and the actual front months (such as January 2014). Also, focus on natural gas spreads such as the NYMEX March 2014/April 2014 one to help “confirm” price trends in outright prices in the natural gas complex. As always, monitor US electricity and coal price levels and trends alongside those in natural gas.

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The CFTC’s Commitments of Traders depicts the participation of noncommercial marketplace participants in various natural gas contracts. Take a look at and combine the noncommercial figures from the benchmark NYMEX natural gas contract (futures and options combined), the NYMEX European look-alike options contract (futures equivalent), and ICE’s Henry Hub contract. As of 11/19/13, the noncommercial were a modest net short of just under 27,000 contracts. This contrasts with their massive net long position of about 367m contracts on 4/30/13, attained around the time of the major high around 444 on 5/1/13.

### **REGIONAL LANDSCAPES**

What does a snapshot of various natural gas regions within the United States show regarding their recent natural gas inventory levels? The Producing Region’s 1284bcf on 11/15/13 (EIA, weekly data) edges up .5pc from 11/15/12’s 1277bcf. The so-called East Consuming Region has become a significant producer due to the shale revolution. On 11/15/13, the East Consuming Region’s 1953bcf is down 5.1pc year-on-year versus 2012’s 2057bcf.total. As of 11/15/13, the West Consuming Region’s 552bcf marches up 1.3pc from the comparable 2012 period’s 545bcf.

The Producing Region’s peak at the end of its 2013 calendar year build season probably will remain 11/8/13’s 1297bcf. This is a new pinnacle in arithmetic terms (EIA weekly data; 1994-present), slightly exceeding 2012’s 1287bcf (11/9/12). The East Consuming Region’s 2096bcf end build season all-time high point (11/2/12) will not be broken this year; the 2013 crest apparently was 11/8/13’s 1984bcf. What about the Western arena? The West’s 11/1/13 stockpile represents a new record height, just above 11/9/12’s 551bcf. Recent weeks after 11/1/13’s elevation hover close to it.

The EIA predicts that end 1Q14 working natural gas inventory in the Producing Region will be 864bcf. That in the East Consuming Region will shrink to 720bcf; the West will have 298bcf at end March 2014.

Study natural gas basis (spread) relationships alongside regional inventory levels and trends. And don’t forget Canadian and Mexican supply/demand in the US context.

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