

US NATURAL GAS INVENTORY- THE PRODUCING REGION STORY

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In the movie “The Producers”, Max Bialystock declares: “Money is honey!” (Mel Brooks, director)

OVERVIEW and CONCLUSION

United States natural gas inventories in the key Producing Region at end winter draw season 2011-12 broke records for that time of year. At their low point on 3/9/12, Producing Region working gas inventory of 965bcf soared about 40.5 percent beyond winter 2010-11’s 687bcf and winter 2008-09’s 690bcf. The new record plateau for the end of draw season blasts 123.9 percent above the end draw season average (1994-2011). Producing region inventories remain sky-high. On 4/20/12 they were 1041bcf. These jump 31.9 percent above last year’s level at this time (789bcf; 4/20/11). When 2012 natural gas build season ends this autumn, stockpiles probably will be lofty relative to long run history.

It is a truism that much can (and will) happen in the natural gas supply/demand battlefield and related theaters between now and the close of 2012 build season. Assume normal summer weather and continued modest American economic growth. Many marketplace generals declare that brimming inventories definitely or almost certainly will cause the Producing Region (“PR”) to suffer notable containment (“overflow”, “overcapacity”) problems this fall. Not only gas and power trading insiders, but also numerous Main Street spectators and assorted political guardians, fervently speak of the explosive gas production increase of the past few years. Because end winter 2011-12 PR gas inventory already stood high in arithmetic (bcf) terms, PR stockpile increases at around the average historical rate (1994-2011 era) during 2012 gas build season will stretch capacity in this key territory.

The PR indeed faces significant containment risks. By end build season 2012, these risks may burst into actual physical problems for much of the region. However, an alternative scenario is more likely. For the PR area as a whole, although the containment challenge probably will be a very close call, the region probably will scrape by. In any event, and as of now, an excessive inventory relative to available storage situation throughout the PR is significantly less certain than many proclaim.

Why question the widespread faith that the PR containment problem will be severe and widespread? Gas demand is rising. Substantial fuel switching from coal to natural gas has occurred and likely will continue. Despite the recent shale gas boom, as well as gas production associated with crude oil output in some locations, US natural gas production growth (overall output) may be less than sentinels forecast. Not only are prices still depressed. The US gas rig count has retreated dramatically.

A crucial consideration for the containment debate in the PR (and elsewhere) is the amount of gas storage available around the time of build season inventory peak. Admittedly, any current viewpoint on US gas storage capacity for the end of build season 2012 is quite conjectural. Nevertheless, relative to the most recent Energy Information Agency (“EIA”) estimates of demonstrated peak working gas storage capacity, sufficient storage in the PR probably has been and will be created to avoid a significant containment problem this autumn.

US NATURAL GAS PRODUCING REGION INVENTORY (1994-2011)

The following table displays US Producing Region seasonal builds for the past 18 years from end winter draw season floor to the given calendar year’s autumn ceiling (EIA weekly historical data). Each column highlights its low and high over 1994-2011. The table lists noteworthy price bottoms and peaks for NYMEX natural gas (nearest futures continuation) around the later part of build season to “shortly after”.

Year (start date)	Inventory Low (bcf)	Inventory Peak (bcf; date)	Inventory Change (arithmetic)	Inventory Change (percent)	Natural Gas: Key Price Low/High (date)	
1994 (3/11)	271	801 (11/18)	530	195.6		
1995 (3/10)	387	768 (11/3)	381	98.4		372 (12/21/95)
1996 (4/12)	186	642 (11/1)	456	245.2	174 (9/5/96)	460 (12/20/96)
1997 (2/28)	249	712 (11/7)	463	185.9		385 (10/28/97)
1998 (3/20)	332	915 (11/6)	583	175.6	161 (8/27/98)	
1999 (3/26)	526	864 (10/22)	338	64.3	208 (11/24/99)	
2000 (4/14)	374	679 (11/10)	305	81.6		1010 (12/27/00)
2001 (3/30)	233	933 (12/14)	700	300.4	176 (9/26/01)	
2002 (3/29)	546	889 (10/25)	343	62.8	264 (8/7/02)	1190 (2/25/03)
2003 (4/11)	198	904 (11/7)	706	356.6	439 (9/22/03)/	763 (1/9/04)
2004 (3/12)	371	968 (11/12)	597	160.9	452 (9/16/04)/	920 (10/28/04)
2005 (3/25)	486	897 (11/18)	401	82.5		1578 (12/13/05)
2006 (3/24)	615	1015 (11/10)	400	65.0	405 (9/27/06)/	905 (11/30/06)
2007 (3/9)	564	1074 (11/23)	510	90.4	519 (8/27/07)	
2008 (3/14)	490	974 (11/14)	484	98.8		
2009 (3/6)	690	1219 (11/27)	529	76.7	241 (9/4/09)	611 (1/7/10)
2010 (3/5)	548	1254 (11/26)	706	128.8	321 (10/27/10)	
2011 (2/18)	687	1261 (11/25)	574	83.6		
AVERAGE 1994-2011	431bcf	932bcf	500bcf	116.0 pc		

At its low point on 3/9/12, Producing Region working gas inventory was 965bcf. The 116.0 percent in the column is 500bcf/431bcf. The average percentage for the 18 periods added together and divided by 18 is 141.8 percent.

The average date for the PR inventory abyss at end winter is approximately March 19. The build season peak arrives around November 13. Over the nearly 240 days from 3/19 to 11/13, the average weekly build is about 34bcf. Within build period in general, as well as during any given calendar year in particular, actual inventory increases of course do not occur in the same weekly quantity. Also, sometimes the PR has had a week-to-week draw, as in the post early August time frame.

SUPPLY, STORAGE CAPACITY, AND CONTAINMENT

In Alfred Hitchcock’s movie, “Lifeboat”, Connie Porter asks the skipper: “All right, Commissar, what’s the course?”

Will arithmetic inventory levels in the PR test available storage capacity (the containment issue) in late autumn 2012? Well-worn warnings that much can happen between now and late autumn should lurk in the background.

What will be Producing Region inventory when 2012 build season ceases? The EIA's 4/10/12 Short-Term Energy Outlook ("STEO"; next release 5/8/12) forecasts end 3Q12 PR gas stocks of 1287bcf. What may end build season be after adjusting that end 3Q12 prediction?

In 2009, PR stocks grew 57bcf from 1162bcf at end 3Q (deriving that end September PR level via interpolation from weekly statistics) to the 1219bcf summit on 11/27/09. PR inventories in 2010 blossomed 177bcf from 1077bcf at end September (estimate from weekly data) to 1254bcf on 11/26/10. In 2011, 9/30/11 actual inventory was 1060bcf. It mushroomed over the next few weeks, by 201bcf to 11/25/11's 1261bcf.

All else equal, substantial containment worries probably tend to minimize inventory builds. The later part of 2009 build period involved containment concern, whereas 2010 and (especially) 2011 reflected notable production increases yet less containment fears than in 2009. Total marketed production grew 2.5 percent year-on-year in calendar 2009 versus 2008, with a 3.5pc advance year-on-year in calendar 2010 relative to 2009. Calendar 2011 total marketed production leaped 7.9pc versus 2010's. Dry gas production statistics show similar percentage year-on-year climbs.

Compare the EIA's PR storage estimates for April (and capacity probably was built from April to the end of the given calendar year season) with peak build season inventory in each of the years. In April 2009, PR demonstrated peak working gas capacity was 1202bcf (compare 1219bcf inventory at the 2009 peak). In April 2010, PR storage was 1297bcf (above the 1254bcf high). April 2011's PR capacity of 1340bcf clearly exceeded 11/25/11's 1261bcf mountainous stockpile.

This recent history hints that significant containment risks (as in 2009) will result in a relatively modest build from end September 2012 to the height of build season. Despite the upward march in US production in 2010 and 2011, one should not take the big PR inventory boosts of 2010 and 2011 for granted, especially if substantial fuel switching to natural gas is likely. At the extremes of high and low build for the past three years, 1287bcf plus 201bcf is 1488bcf, whereas 1287bcf plus 57bcf equals 1344bcf. Even if a very modest increase (as in 2009) may seem rather unlikely for 2012, so arguably do the massive climbs of 2010 and 2011. The average increase from end September to the build pinnacle of these three years of 145bcf is a suitable compromise for the time being. **Adding 145bcf to the EIA's 1287bcf September 2012 estimate gives a 2012 build season inventory peak of 1432bcf.**

In marketplaces, what is a "high", "low" or "average" level or change is a matter of opinion. These viewpoints on "high" and so forth can vary over time. Weather of course can be a key factor. Anyway, the preceding table reveals something else. Over the 1994-2011 era, for a given build season, there has been some tendency for end winter seasons with "high" PR inventory levels to be followed by relatively modest percentage increases in inventory by the time of that calendar year build peak. Note 2006, 2009, and 2011; 1999 and 2002 also fit this pattern. In 1999 and 2002, the inventory at end winter was relatively high relative to preceding years (it took until end winter 2006's 615bcf to exceed them). The reverse also is true; large percentage leaps in build season inventory frequently follow situations starting with "low" PR supply. See 1994, 1996, 1997, 2001, and 2003.

Since the end inventory level at end winter 2012 in the Producing Region was extremely high, this past pattern over the entire build season hints that the overall build this year will be relatively low. It also indicates that one should be conservative regarding additions to the EIA's end 3Q12 estimate (in other words, 145bcf is not too little).

One can calculate end build season 2012 gas inventories via another method. As an alternative to adding a number to the EIA's 3Q12 estimate, start with 3/9/12's actual 965bcf.

Some wizards will underscore that last year's build season was very hot. They stress that calendar 2012 production is up a lot so far versus the prior year. so the "reasonable" estimate increase for PR over 2012 build season should be much more than 500bcf. The EIA's STEO states US total marketed production of 69.4bcf/day flies 8.7pc higher in first quarter 2012 versus 1Q11, with 1Q12 dry production of about 66.0bcf/d up 8.4pc over the comparable prior year period.

However, the EIA shows production shows yearly growth slowing relative to the 1Q12 pace (and the calendar 2011 versus 2010 one). Full year total dry production increases 4.4 percent, with 4Q12 about flat against 4Q11's. Moreover, the EIA clairvoyants say total 2013 dry (and total marketed) output will be essentially unchanged relative to 2012. And remember fuel switching issues and the potential for little production growth (and higher gas demand) at low prices.

Admittedly, as a percentage of the starting inventory, the 51.8pc build percentage (500bcf/965bcf) would be a record low percentage rise. However, 2009's was only 529bcf (and that build season year commenced with elevated inventory by historic standards), 2007's 510bcf, and 2008's 484bcf. **Thus the best approach involves adding the average 1994-2011 build of 500bcf gives 1465bcf.**

In any event, end build season 2012 PR inventory probably will range around the 1432 to 1465bcf band. Again, as much will occur between now and then, actual ending stocks may differ substantially from this guideline prediction.

Now visit the EIA's "Peak Underground Working Natural Gas Storage Capacity" (8/31/11; next release August 2012). This study provides national and regional "Demonstrated Peak Working Gas Capacity" as of April 2011.

The total amount of incremental (new) storage added since April 2011 to the present, as well as what further space will be supplied by late autumn 2012, obviously are questions of fact. However, the April 2011 levels are old news and very probably not a good benchmark for 2012.

First, since the EIA storage survey first appeared in 2006, total US demonstrated peak working gas storage capacity has grown every year. April 2011's 4103bcf rose 54bcf (1.3 percent) versus April 2010's 4049bcf. Little was added in the East (only 9bcf) and West (2bcf) regions. The national estimate for April 2010 was 160bcf (up 4.1pc) over April 2009's 3889bcf. That was up 86bcf (2.3pc) from the 2007 estimate (which apparently was for August 2007); 2007 rose 110bcf (3.1pc) versus 2006 (apparently June 2006).

Although Producing Region data is only available since 2007, it depicts continual year-on-year storage rises since then. Each year, the PR had the majority of the national capacity build. The April 2011 PR storage capacity of 1340bcf grew a modest 43bcf (3.3pc) relative to April 2010's 1297bcf. However, prior years show larger capacity growth. April 2010 rose sharply versus April 2009's 1202bcf- 95bcf and 7.9pc. The April 2009 was up 56bcf (4.9pc) against April 2008's 1146bcf. The 2008 total climbed 50bcf (4.6pc) relative to the 2007 survey's 1096bcf.

Within the PR from 2007 through 2011, the average yearly build was around 61bcf and 5.2 percent.

Like this overall capacity increase trend of the past few years, other intertwined variables portend at least a modest storage rise since April 2011. Containment concerns (recall 2009 build season) probably tend to inspire the gas industry to undertake a greater than average storage capacity build program. Note the substantial jump in April 2010 PR capacity (95bcf and 7.9pc) versus the prior period. A trend of higher production alongside rising demand probably encourages storage creation for a commodity with a substantial seasonal build (and draw) patterns. Not only has US gas production advanced northward over the past many months (focus on calendar 2011 through 1Q12). US overall demand also is ascending- even with the slump in residential demand due to a very mild winter (1Q12 residential demand was down over 4.2bcf versus 1Q11). The EIA states total US consumption was about 66.8bcf/day in calendar 2011. Moreover, and quite significantly, it forecasts a sharp 4.2 percent demand rise to 69.6bcf/d in calendar 2012, with calendar 2013 predicted at over 70.5bcf/d. Compare 2010's 66.0bcf/day and 2009's 62.8bcf/d.

End build period stocks in recent history (from 2009-2011) have been rather high. Low interest rates and substantial sustained contango in natural gas intramarket spreads encourage storage development. These considerations further encourage storage creation.

To assess the likelihood of severe containment problems throughout the Producing Region (and related natural gas price implications), the crucial issue therefore is how much natural gas storage probably has been and will be constructed (developed) since April 2011 (the most current EIA overview). The yearly changes described above for the PR cover 12 month periods (April versus April, though the 2007 review was in August, so was a bit shorter). October 2012 of course is 18 months since April 2011. So to derive an estimate of demonstrated peak working gas storage capacity for end October 2012 on the basis of these annual (12 month) statistics for 2007-11, one must adjust them upward by multiplying them by 1.5. End October is fairly close to the November 13 average build season peak date.

For the Producing Region since April 2011, assume various percentage changes over the 18 months to generate estimates for end October 2012 storage capacity. Two percent growth in demonstrated peak working gas capacity gives 1353bcf (1340bcf *1.02), three pc makes 1380bcf, four pc 1394bcf. Relative to anticipated end build season 2012 inventory, such mediocre storage expansion probably would not avoid a noteworthy containment problem. However, historical analysis and the other considerations noted above suggest these estimated PR boosts over the 18 months probably are much too conservative. The lowest 12 month build in the PR was 3.3 percent, so rounding that up for an 18 month period is almost five percent (3.3 times 1.5).

A five percent jump in storage capacity from end April 2011's 1340bcf gives 1407bcf (1340*1.05). Relative to the hypothetical end build season inventory range of 1432-1465bcf, this capacity probably would not preclude some containment problems in the PR. Even if no widespread and severe problems emerged around the end of build season, yet from now until then, many people would be fearful of their occurrence.

However, a five percent capacity increase also probably is too cautious for that 18 month period. It is less than the 18 month average for those four year-on-year changes (5.2 percent times 1.5). Also, keep the rising supply/demand situation in mind. Containment fears may well induce a substantial storage creation response. Again, recall that end build season in calendar year 2009

had a substantial containment issue (concern). Delve once more into supply/demand particulars. For April 2010 versus April 2009, capacity rose 95bcf in the PR, or 7.9pc year-on-year. Also, natural gas demand soared about 5.1pc from calendar 2009 to calendar 2010. In this context, don't forget that the EIA forecasts calendar 2012 US natural gas consumption will rise a robust 4.2pc from the calendar 2010 total (not much less than the 2010 versus 2009 demand leap).

In regard to the relatively modest boost in PR storage for April 2011 relative to April 2010 (3.3 percent year-on-year, about five percent if extended to 18 months), note the modest 1.2 percent US gas consumption growth in calendar 2011 versus calendar 2010 (66.8bcf versus 66.0bcf). This demand growth is much lower than that of 2010 versus 2009, or as expected in 2012 relative to 2011. And the PR's storage build of 2011 probably did not reflect (respond to; face) a containment problem fear as severe as the one of end build season 2009 (and that arguably exists now).

Consequently, since April 2011, a five percent total Producing Region capacity growth for the 18 months until end October 2012 is probably too conservative. A more likely scenario is an increase of at least the four year average of 7.8pc (5.2pc*1.5). So **1340bcf*1.078pc is 1445bcf. This falls within the 1432bcf to 1465bcf range for the 2012 build peak in Producing Region inventory. Although such storage levels are not ample relative to anticipated inventory, they therefore appear sufficient to avoid severe and widespread actual containment problems in the PR. This viewpoint nevertheless is a close call.**

Although substantial PR containment problems for 2012 are not nearly as certain as many players believe, these containment fears (risks) are not fanciful. Significant containment problems could appear (especially if operators do not create sufficient storage). What if summer 2012 is cooler than normal?

Even if massive containment problems ultimately do not appear in practice in the PR during build season 2012, the price downtrend that ended in early September 2009 should not be forgotten. The 2012 storage capacity cushion probably is not large. Compare the size of the hypothetical inventory cushion in 2012 with that of 2009. Remember the PR's 1202bcf demonstrated peak working gas capacity for April 2009 with actual 11/27/09 PR inventory level of 1219bcf in the context of the savage price collapse to 9/4/09's 241 low (NYMEX nearest futures continuation).

Also compare the 1297bcf PR capacity in April 2010 with 11/26/10 PR stocks of 1254bcf alongside the price fall to 321 on 10/27/10.

Perhaps the Producing Region hoard will exceed 1465bcf. Or, suppose PR storage grows close to 11.8pc from April 2011 to end October 2012 (7.9*1.5; the April 2010 jump versus April 2009 was 7.9pc). That makes capacity 1498bcf (1340*1.118).

LOOKING BACKWARD AND FORWARD: SOME PRICE and TIME TALK

Second Officer C.H. Lightoller: "Yes, I don't think I've ever seen such a flat calm."

Captain Smith: "Like a mill pond, not a breath of wind."

Second Officer Lightoller: "It will make the bergs harder to see...with no breaking water at the base." Conversation from the film "Titanic" (James Cameron, director)

Historical review of PR inventory levels and patterns alongside NYMEX natural gas price trends and levels reveals a seasonal tendency for natural gas prices (NYMEX nearest futures continuation) to establish important lows sometime in the later stage of Producing Region (and US) build season. See the table above. Several of these lows were major trend change points. Although this history is relatively brief, prices display a rough seasonal inclination to achieve important lows around late calendar August through calendar September. This is a guideline, not a destiny. Some lows were outside this calendar range. The 8/7/02 low was an important take-off point, with 10/27/10 a noteworthy valley. Moreover, not every year has a notable bottom in late summer through fall.

Despite some seasonal tendency for prices to finish a bear move (or end an important stage in a downtrend) in late summer or autumn, it does not follow that prices drop off a cliff from the preceding end winter (or early spring) without an interim rally. The price could make a low, rise for a few months, and then drop to make a bottom in (for example) late August or calendar September.

Relative to historical averages, the mournfully high Producing Region inventory at end winter 2011-12 becomes less dreadful (though still bad) from the percentage perspective by end build season. The end 1Q12 inventory of 965bcf divided by the long run average end winter inventory of 431bcf is 123.9 percent above average. Suppose end build season 2012 inventory is 1465bcf. That exceeds the 1994-2011 average by 57.2pc. Looking toward a more distant horizon, the EIA predicts Producing Region inventories at end 1Q13 of 864bcf, about 10.5pc less than 1Q12.

With its slump under 200 to a 4/19/12 low at 190, natural gas reached a depth not seen for 10 years (185 trough on 1/28/02; 176 bottom 9/26/01). How likely is a further straight line precipitous decline?

Recall the major high at 611 on 1/7/10. Despite the major bear move since then, recall noteworthy interim bull charges. In 2010, after diving to a low at 381 on 4/1/10, note the tops on 6/15/10 at 519 and 8/16/10 at 501. The price then sunk to 361 on 8/27/10 and 321 on 10/27/10. Natural gas gradually rallied in assorted twists and turns from there, making a crucial pinnacle on 6/9/11 at 498.

Thus the past two calendar years had key highs in calendar June. Suppose a rally continues over the next several weeks. Calendar June 2012 is a time around when an interim top may appear. Again, history is not destiny.

Yet suppose when mid-year 2012 arrives (or shortly thereafter), the potential PR containment problem does not appear solved or close to being so. Then a significant (renewed) bear move may ensue. If it does, keep in mind the seasonal tendency for price lows to occur in late August/calendar September. If the real world PR containment problems turn out to be severe, the related distress sales could spark deep (even if temporary) price declines.

Significant pinnacles in front month natural gas do not always appear in December, January, and February “shortly after” build season departs. In addition, long run history reveals that several major lows have occurred in calendar January and February.

Low prices (especially beneath 225 or so) may encourage natural gas demand and induce production cuts, thus helping to avert a containment problem. However, sustaining prices above a “fairly high” level (at least high relative to the lows of 2012) may mitigate the gas output reduction as well as reduce the gas demand increase. What price is “fairly high”? Arguably around 300, though some claim it is lower. In any event, the higher the spot price (nearest futures basis) climbs, the greater the chance of a PR containment problem. Here again, the amount of storage capacity available at end build season 2012 remains crucial.

Suppose the April 2012 level around 190 (NYMEX nearest futures continuation) holds. Then monitor not only the 223 low of 1/23/12 (3/13/12 low around 220), but also the major low near 241 on 9/4/09.

All else equal, if a containment problem (or fear) similar to 2009 in magnitude arguably exists, players should pay close attention to the level and timing of the 2009 price bottom.

Though 2009’s major low was in early September, note also that prices advanced sharply from an interim low in late November (11/24/09) to the major high at 611 on 1/7/10.

Keep an eye on seasonal and calendar strip trends, as well as electricity and coal prices. A rally (reduced contango) in the NYMEX October 2012 less January 2013 natural gas spread would confirm (reflect) a rally in the outright price. A rally (increasing backwardation) in NYMEX March less April gas spreads (for calendar 2013 and subsequent years) likewise would confirm a bull move in the NYMEX spot price.

Will containment be a problem in autumn 2012 in the US Eastern and Western consuming regions, or in Canada?

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