

Natural Gas: Winter 2012-13

Abundance! *...and Some Confusion*

NASEO Winter Fuels Outlook

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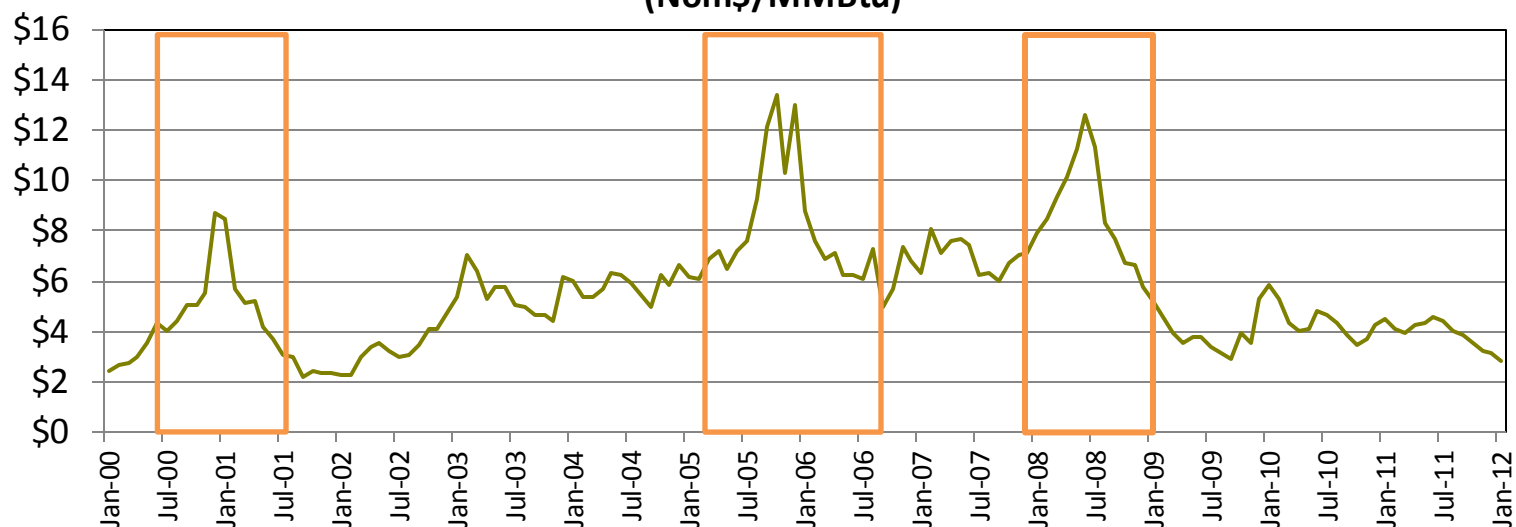
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Historical Natural Gas Prices

Monthly Average Gas Prices at Henry Hub
(Nom\$/MMBtu)

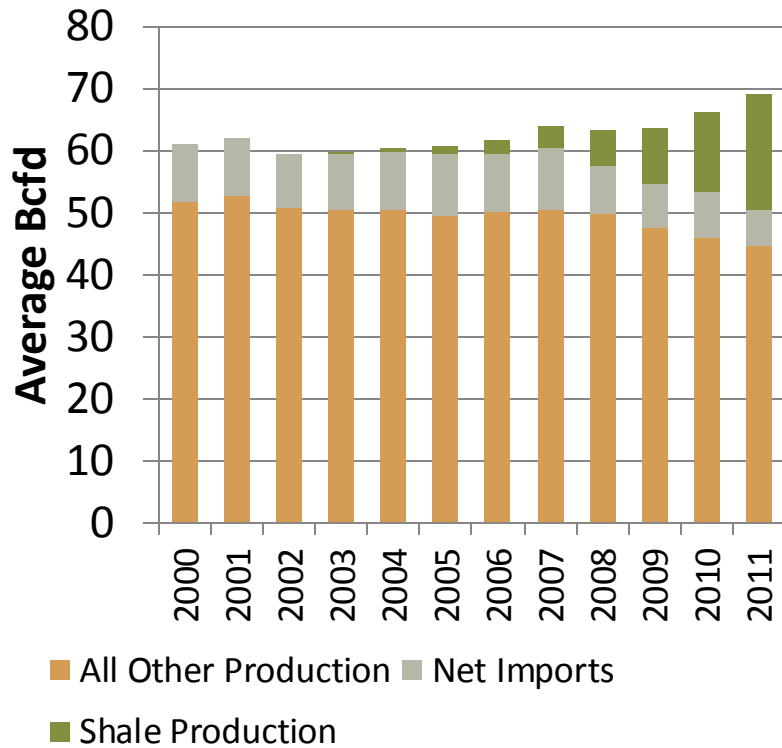


Source: Platts

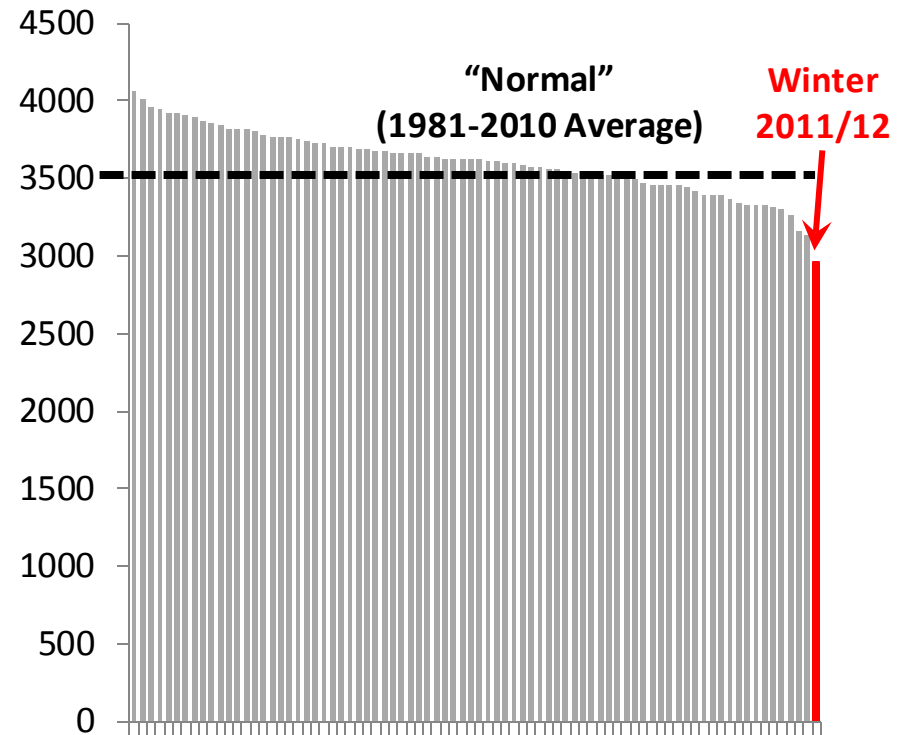
- In the last decade, there were three periods where natural gas prices spiked.
- Each of these periods had a different driver for the increase in prices.
- Recently, prices have collapsed.

Gas Supply from Shale and Consumption affected by Warm Weather Reduced Gas Prices in 2012

U.S. Gas Supplies (Annual Average Bcfd)



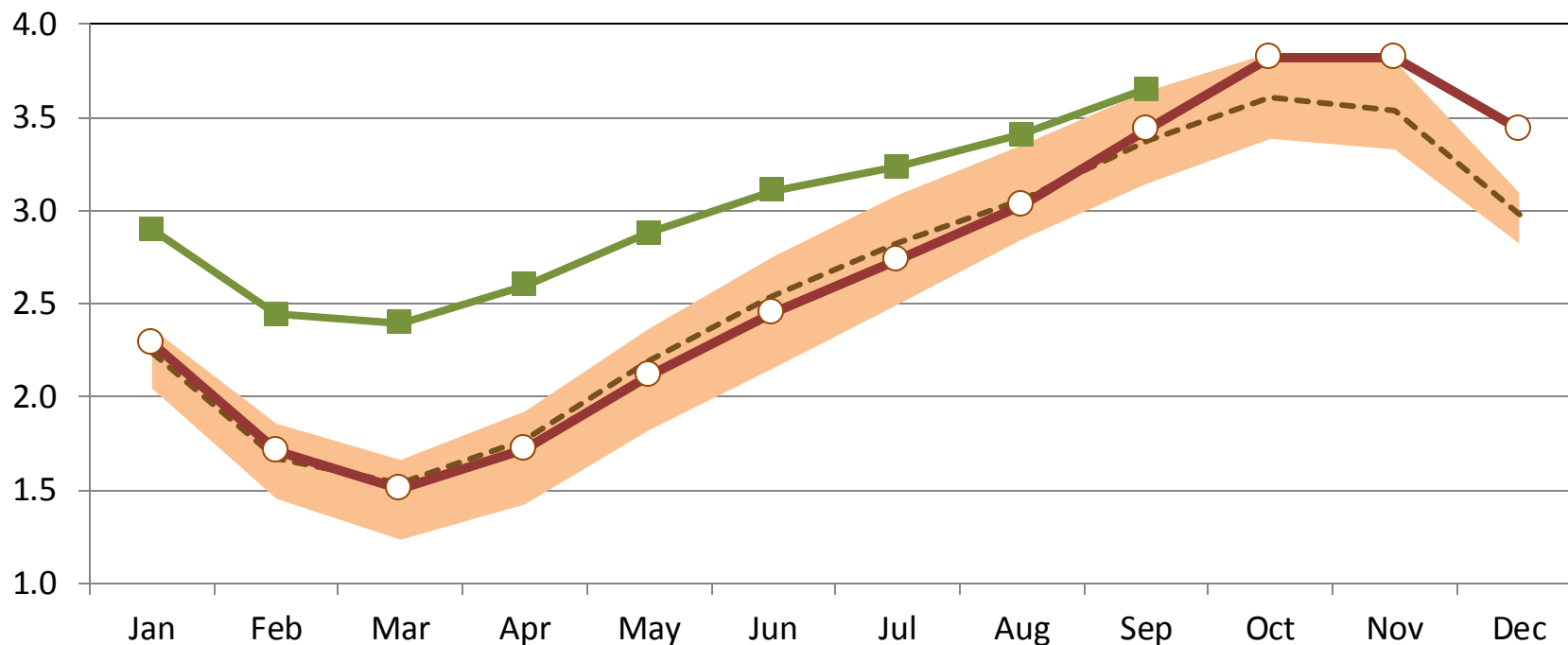
Distribution of Winter Heating Degree Days, 1931/32 through 2011/12



Storage Fill Levels Will Likely Reach Record Highs This Fall



U.S. Natural Gas Storage Working Gas Levels (Tcf)



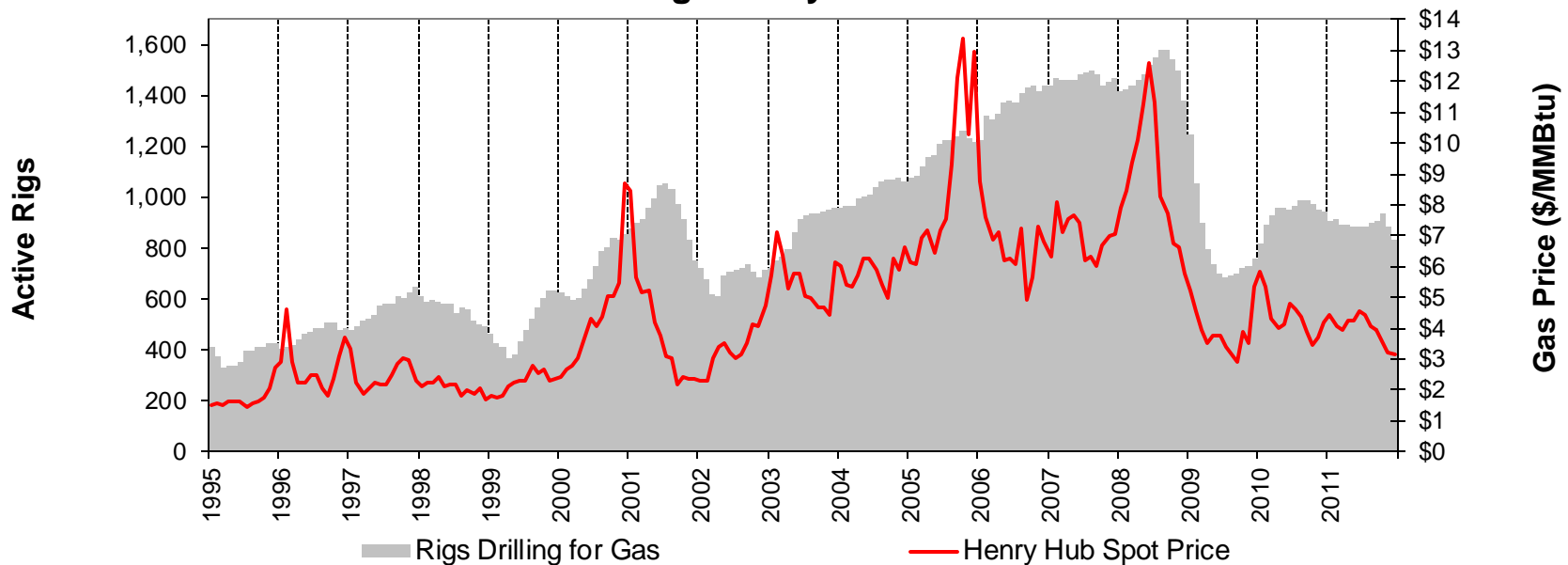
Source: EIA
w/ ICF Forecast

Range, 2006-2010
 Average, 2006-10
 2011
 2012

- Working gas levels exited the winter at a record high level and will likely approach 4 Tcf this October.
- Unless this coming winter is colder than normal, some of the storage surplus may extend into 2013.

Gas Drilling Response to Price Movements

U.S. Gas-Directed Drilling Activity and Gas Prices

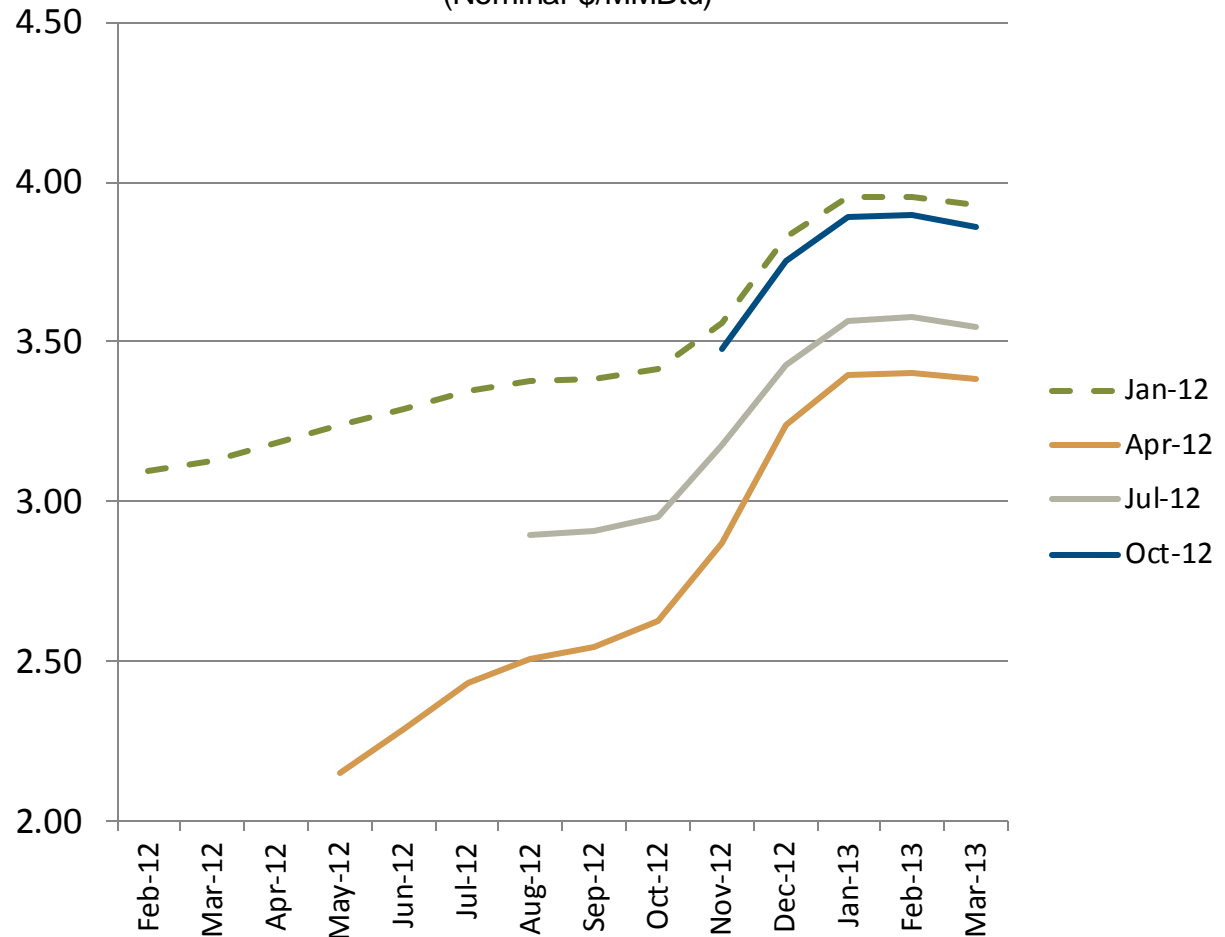


- In response to each of the three previous price spikes, drilling levels increased. The resulting increase in supply moderated prices.
- In the most recent period, gas supplies have been increasing even though rig activity is more than 50 percent below peak levels.

Natural Gas Price Expectations have Changed Several Times over the Last Year

NYMEX Futures
(Nominal \$/MMBtu)

- Extremely warm weather in the first few months of 2012 dramatically affected natural gas prices.
 - The lower prices were reflected in market expectations.
- As the year progressed, the understanding of the impact of low prices on drilling activity has resulted in an increase in expected prices.



Weren't we running out of gas?

The North American Natural Gas Resource Base Could Support Current Levels of Gas Use for About 150 Years



U.S. and Canada Natural Gas Resource Base¹

(Tcf of Economically Recoverable Resource, Assuming Current E&P Technologies)

- In total, the U.S. and Canada have almost 4,000 Tcf of resource that can be economically recovered using current exploration and production (E&P) technologies.
 - At current levels of consumption, this is enough resource for about 150 years.
 - As technologies improve and new discoveries are made, the total gas resource is likely to grow.
- Over 50% of the assumed resource is shale gas.

	Proven Reserves	Unproved Plus Discovered Undeveloped	Total Remaining Resource	Shale Resource ²
Alaska	7.7	153.6	161.3	0.0
West Coast Onshore	2.3	24.6	27.0	0.3
Rockies & Great Basin	66.7	388.3	454.9	37.9
West Texas	27.6	47.7	75.3	17.5
Gulf Coast Onshore	70.1	684.7	754.8	476.9
Mid-continent	37.0	205.0	241.9	133.9
Eastern Interior ^{3,4}	18.6	1053.7	1072.3	986.1
Gulf of Mexico	14.0	238.6	252.5	0.0
U.S. Atlantic Offshore	0.0	32.8	32.8	0.0
U.S. Pacific Offshore	0.8	31.7	32.5	0.0
WCSB	60.4	664.0	724.4	508.8
Arctic Canada	0.4	45.0	45.4	0.0
Eastern Canada Onshore	0.4	15.9	16.3	10.3
Eastern Canada Offshore	0.5	71.8	72.3	0.0
Western British Columbia	0.0	10.9	10.9	0.0
US Total	244.7	2,860.6	3,105.3	1,652.5
Canada Total	61.3	807.6	868.8	519.1
US and Canada Total	306.0	3,668.1	3,974.1	2,171.6

1. ICF updated its gas resource assessment in December 2011; while these regional totals may not fully reflect the current assessment, the U.S./Canada economically recoverable resource is similar.

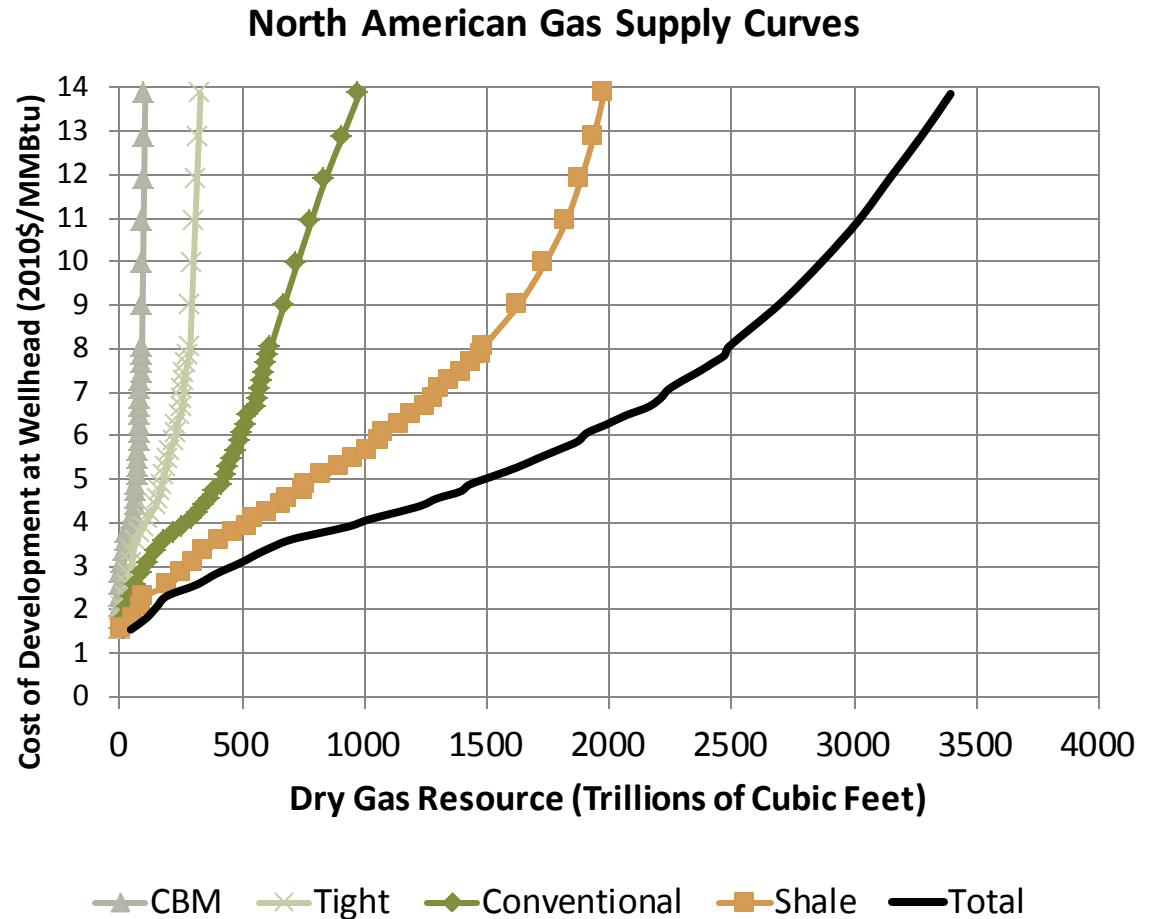
2. Shale Resource is a subset of Total Remaining Resource

3. Eastern Interior includes Marcellus, Huron, Utica, and Antrim shale.

4. Reference case assumes drilling levels are constant at today's level over time, reflecting restricted access to the full resource development.

North American Gas Supply Curves

- The existing North American resource base includes about 1,500 Tcf of gas that is economically recoverable at \$5 per MMBtu.
 - Shale gas accounts for over half of the gas economically recoverable at \$5 per MMBtu.
- Total cost of developing the new resource includes exploration, development and O&M costs (both fixed and variable cost).





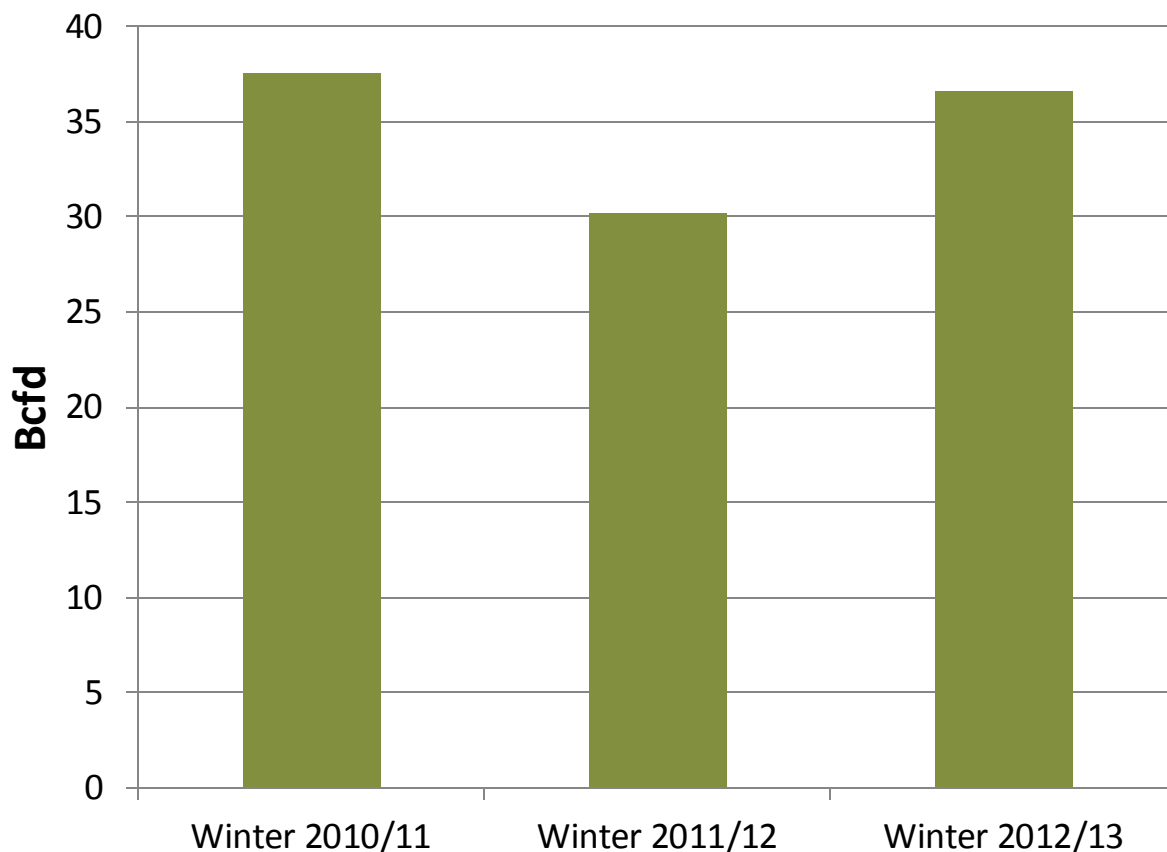
Natural Gas for *Winter 2012-13*

ICF September Base Case Projection

Residential and Commercial Gas Consumption



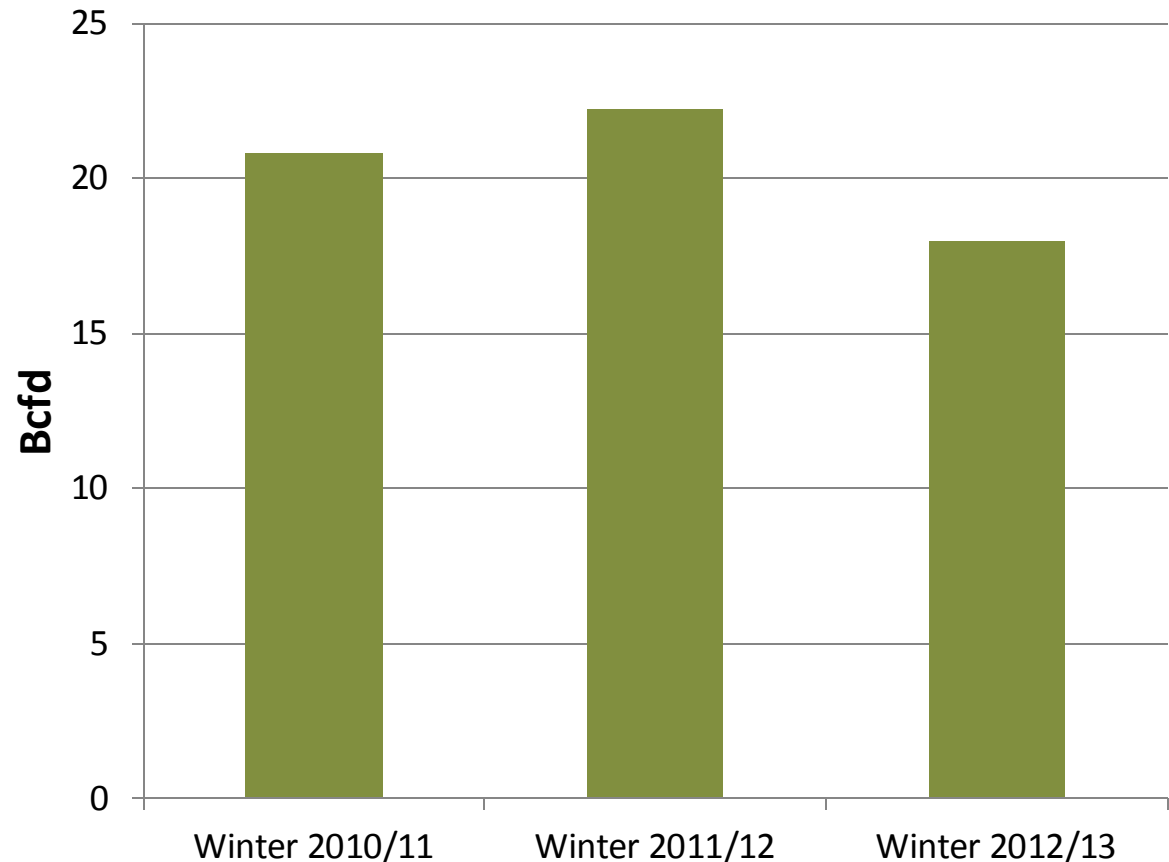
- Assuming normal weather, residential and commercial gas consumption in the coming winter (2012-13) will average 36.6 Bcfd.
- Last winter (2011-12), residential and commercial gas consumption was only 30.3 Bcfd due to very warm weather.
- During the 2010-11 winter, which was slightly colder than normal, residential and commercial gas consumption was 37.6 Bcfd.



Weather assumed to be consistent with past 30 year averages. January 2012 through August 2012 uses actual weather; all forecast months from September 2012 forward are assumed to be consistent with the 30-year averages.

Gas Consumption for Electricity Generation

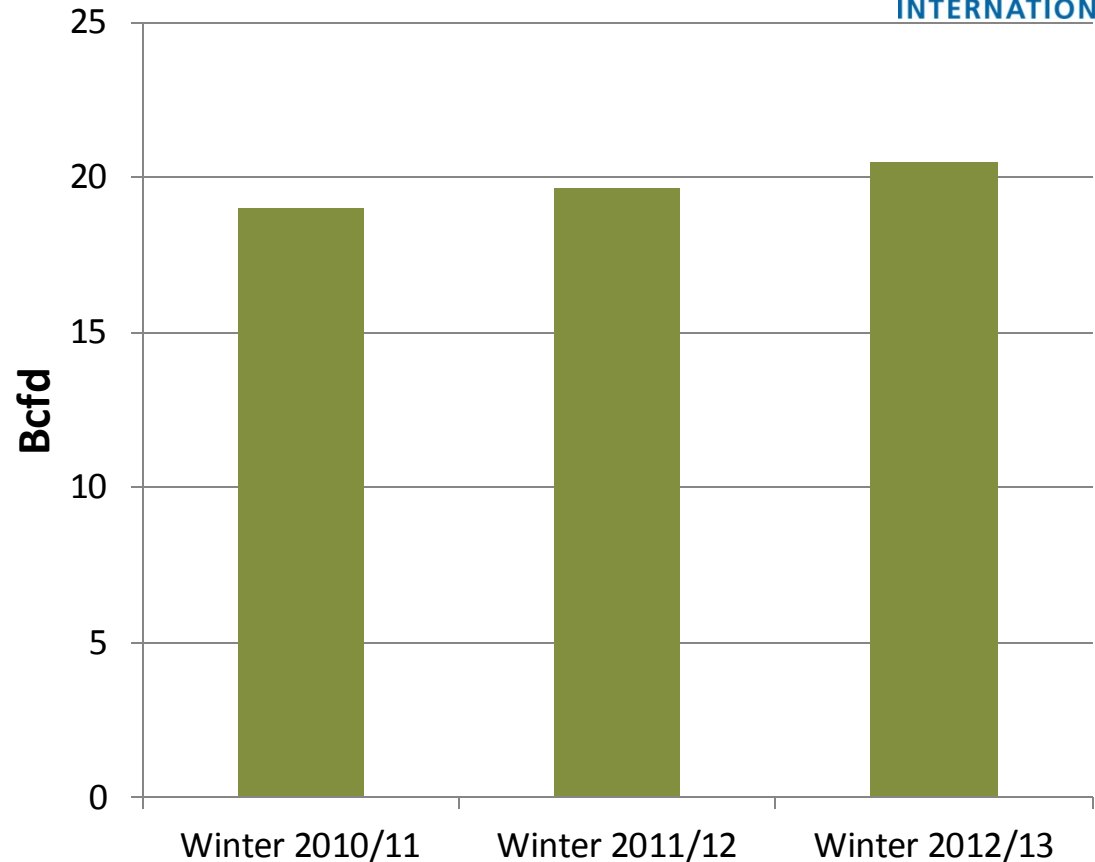
- Even with a return to normal weather (assumed), gas consumption for power generation this coming winter (2012-13) will be 4.2 Bcfd lower than the previous winter.
- Gas prices in winter 2012-13 compared to winter 2011-12 will reduce the amount of economic fuel switching from coal to gas.



Weather assumed to be consistent with past 30 year averages. January 2012 through August 2012 uses actual weather; all forecast months from September 2012 forward are assumed to be consistent with the 30-year averages.

Industrial Gas Consumption

- A modest economic recovery and a return to normal weather will increase gas consumption in the industrial sector slightly in the winter of 2012-13.
 - 20.5 Bcfd in 2012-13
 - 19.6 Bcfd in 2011-12
 - 19.0 Bcfd in 2010-11



Weather assumed to be consistent with past 30 year averages. January 2012 through August 2012 uses actual weather; all forecast months from September 2012 forward are assumed to be consistent with the 30-year averages.

Gas Supply and Demand are Likely to Remain in Balance During the Winter Heating Season



U.S. Natural Gas Supply/Demand Balance

Average Billion Cubic Feet per Day

- Gas consumption is likely to grow compared to last winter.

- Large growth in heating load will be somewhat offset by declines in power generation requirements.
- Economic fuel switching from coal to gas will be lower than last winter.

- Production is likely to continue to grow very slightly, despite lower gas prices.

- Growth continues to be spurred by shale gas production.

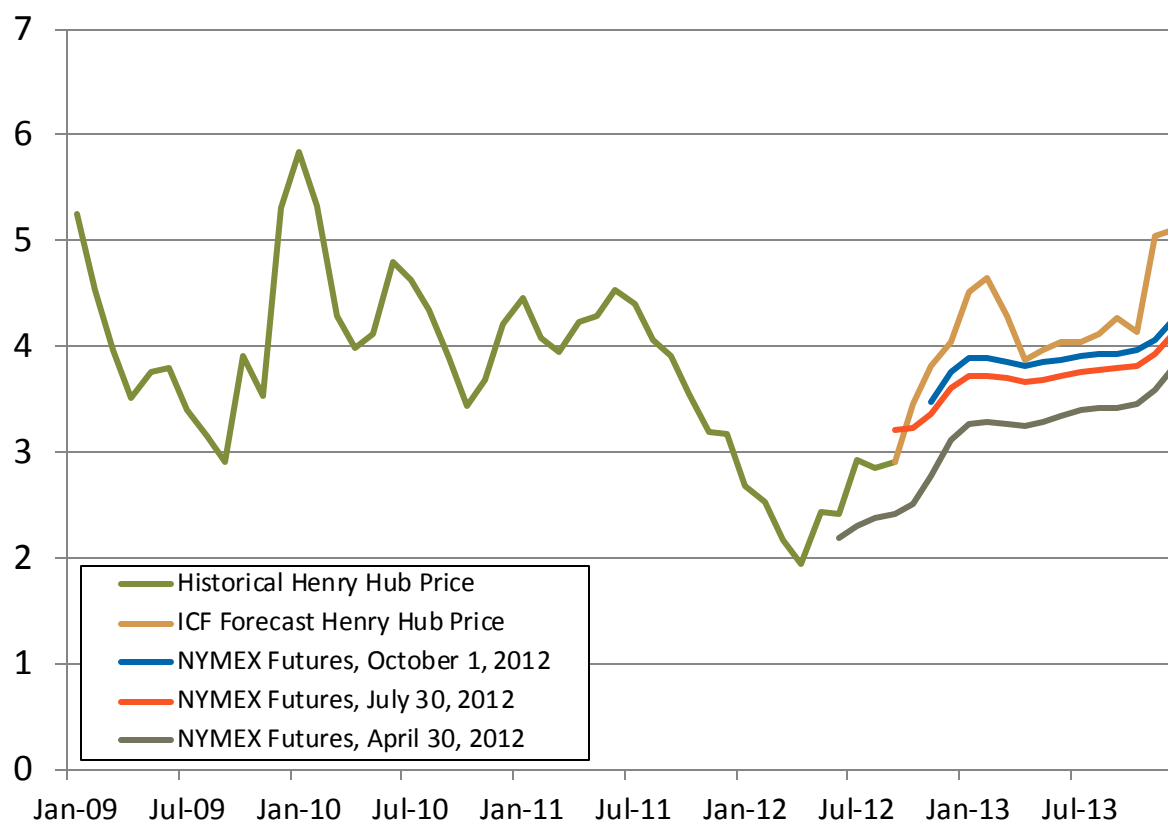
	Injection Season				Withdrawal Season			
	2010	2011	2012	2013	2009/10	2010/11	2011/12	2012/13
Gas Demand								
R/C/I Gas Use	27.6	29.3	29.8	31.5	54.1	56.5	49.9	57.1
Power Gas Use	21.7	22.5	27.5	22.5	17.8	20.8	22.2	18.0
Other Gas Use	5.6	5.9	6.1	5.9	5.6	6.0	6.2	6.2
Net Injections	10.9	11.1	6.9	9.2	0.0	0.0	0.0	0.0
Demand Total	65.8	68.8	70.3	69.0	77.5	83.3	78.3	81.3
Gas Supply								
US Production	59.7	64.6	65.4	66.1	56.4	62.2	65.5	65.6
Net Imports	7.2	5.3	5.7	3.9	7.1	6.6	4.1	5.0
Net Withdrawals	0.0	0.0	0.0	0.0	15.1	15.8	9.7	12.0
Supply Total	66.9	69.9	71.1	70.0	78.7	84.6	79.3	82.7
Balancing Item (S-D)	1.0	1.1	0.9	1.0	1.2	1.3	1.0	1.4

Gas Prices are Likely to Recover but Remain Relatively Low over the Next 18 Months

Projected Natural Gas Prices Versus NYMEX

Nominal Dollars per MMBtu

- Near-term gas prices are projected to average between \$4 and \$5 per MMBtu.
 - On average, our projection of future prices is still above the recent future strip.
 - We also project greater seasonal variability.
- Consumer gas bills in the 2012-13 winter will reflect the commodity that are likely to be lower than commodity prices from 2007 through 2010.

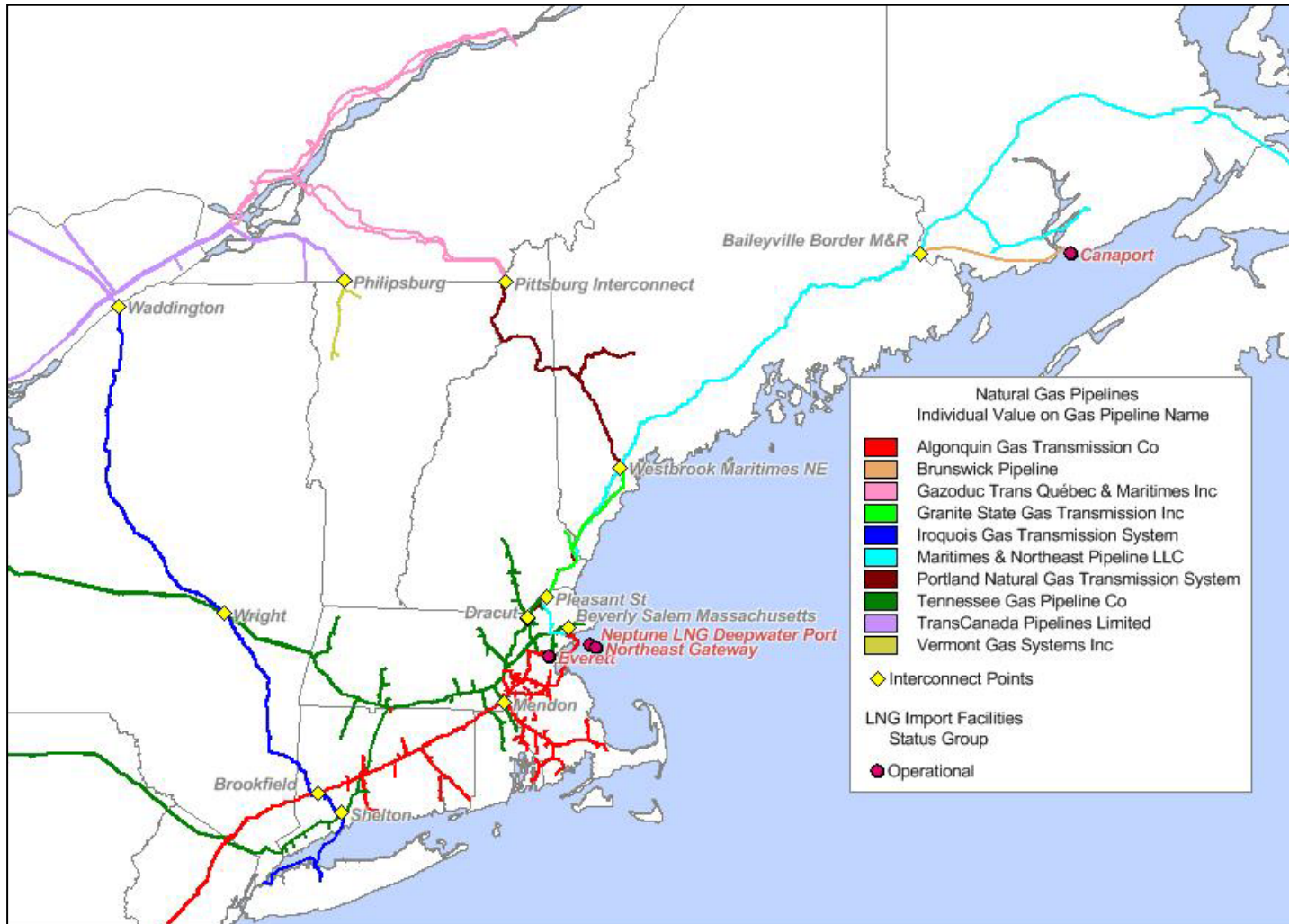


Natural Gas in New England



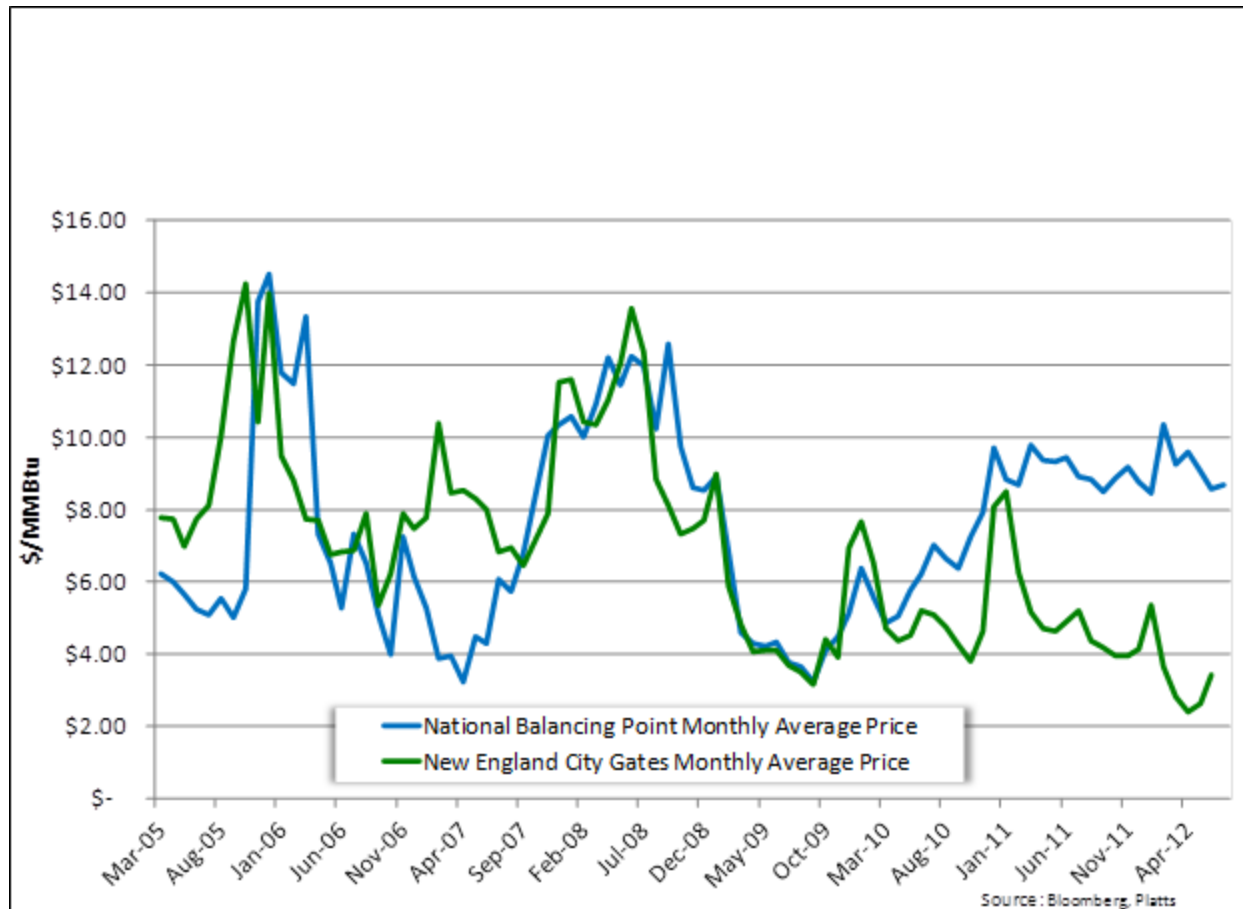
- The New England market is supplied with natural gas from four sources.
 - Pipeline deliveries from the south through New York;
 - Pipeline deliveries from Canada, directly and through New York;
 - Pipeline deliveries from eastern Canada, primarily offshore, and;
 - LNG deliveries, primarily through Canaport and Everett.
- Gas consumption for power generation increased in New England, but pipeline capacity has not.
- Gas LDCs contract for firm capacity on the pipelines while many generators rely on interruptible transportation service from the pipelines.

Natural Gas Delivery into New England



LNG Supplies are being bid away from New England

Comparison of Indicative Prices for LNG to Gas Prices in New England
(U.S. Dollars per MMBtu)



Natural Gas in New England



- If there is normal or colder than normal weather, gas delivery capacity will be tight into New England.
 - Gas Local Distribution Companies with firm transportation contracts into the region should receive their gas supply for their customers and be somewhat insulated from movements in spot market prices.

- Pipelines may not be able to serve all of the electric generation load requesting interruptible service.

Conclusion



- Nationally, gas supply is abundant.
- That said, gas prices will likely continue to firm.
 - Even with the recent rebound and continued firming, gas prices for the coming winter will remain well below the prices paid during much of the previous decade.
 - But gas prices will continue to fluctuate from year to year.
- In New England, congestion on pipelines and inadequate gas supplies connected to specific pipelines could pose operational challenges for electric generation and the pipelines that serve that load.