Natural Gas - Domestic Production and Demand Forecast

How Will Recent Hurricanes Impact the Market?

2005-2006 Winter Fuels Outlook Conference
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Energy and Environmental Analysis, Inc.

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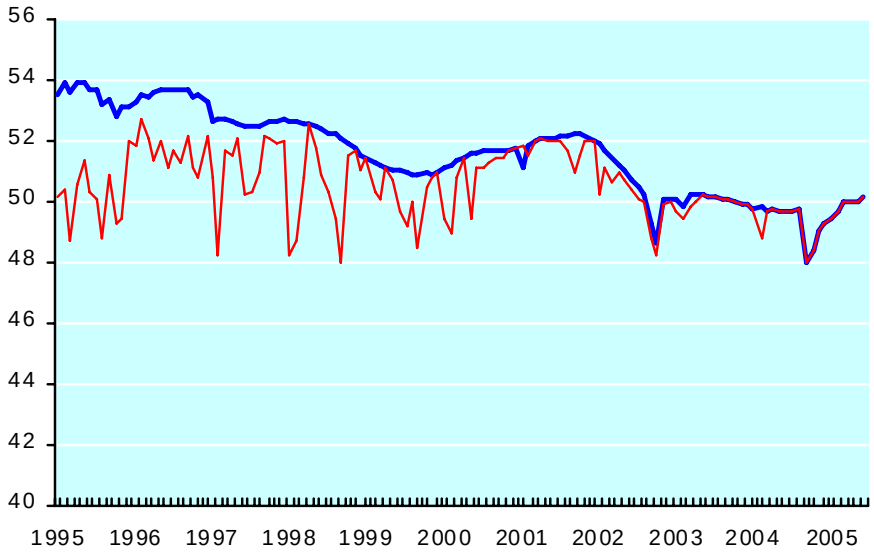
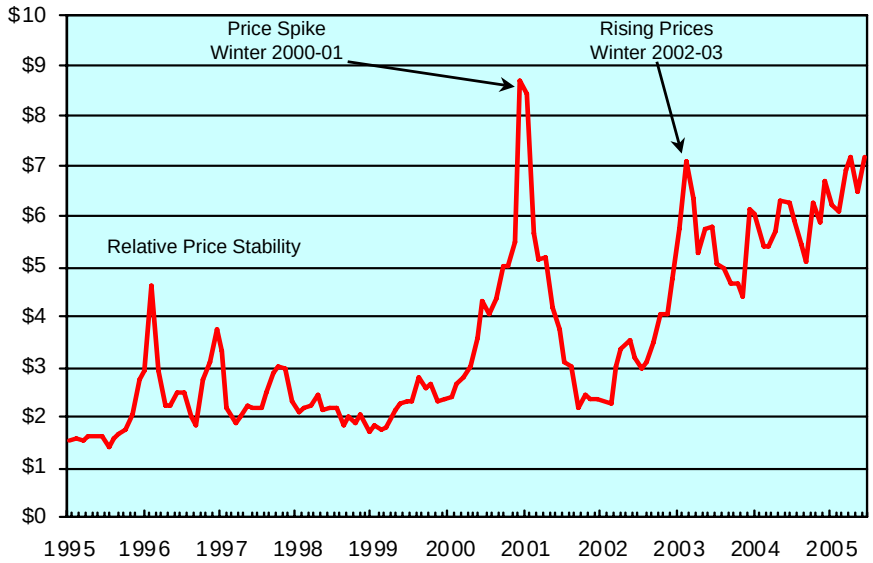
Note: All presented information is from EEA's Monthly Gas Update and EEA's Gas Market Compass.

Introduction: Recent Gas Balance and Prices (through June, 2005)

Lower-48 Gas Production Versus Deliverability (Bcfd)



Historical Gas Price at Henry Hub ($ per MMBtu)



Source: Platts Gas Daily & Energy and Environmental Analysis, Inc.

Divergent trends in gas supply and demand have led to the tight balance between supply and demand, higher gas prices, and increased price volatility.

TIGHT BALANCE EXPECTED TO CONTINUE

2005-06 Winter Outlook

Caveats

1) There is much uncertainty for the upcoming winter as the gas industry is still gathering and assessing information about the status and recovery of facilities in the Gulf Coast Area.

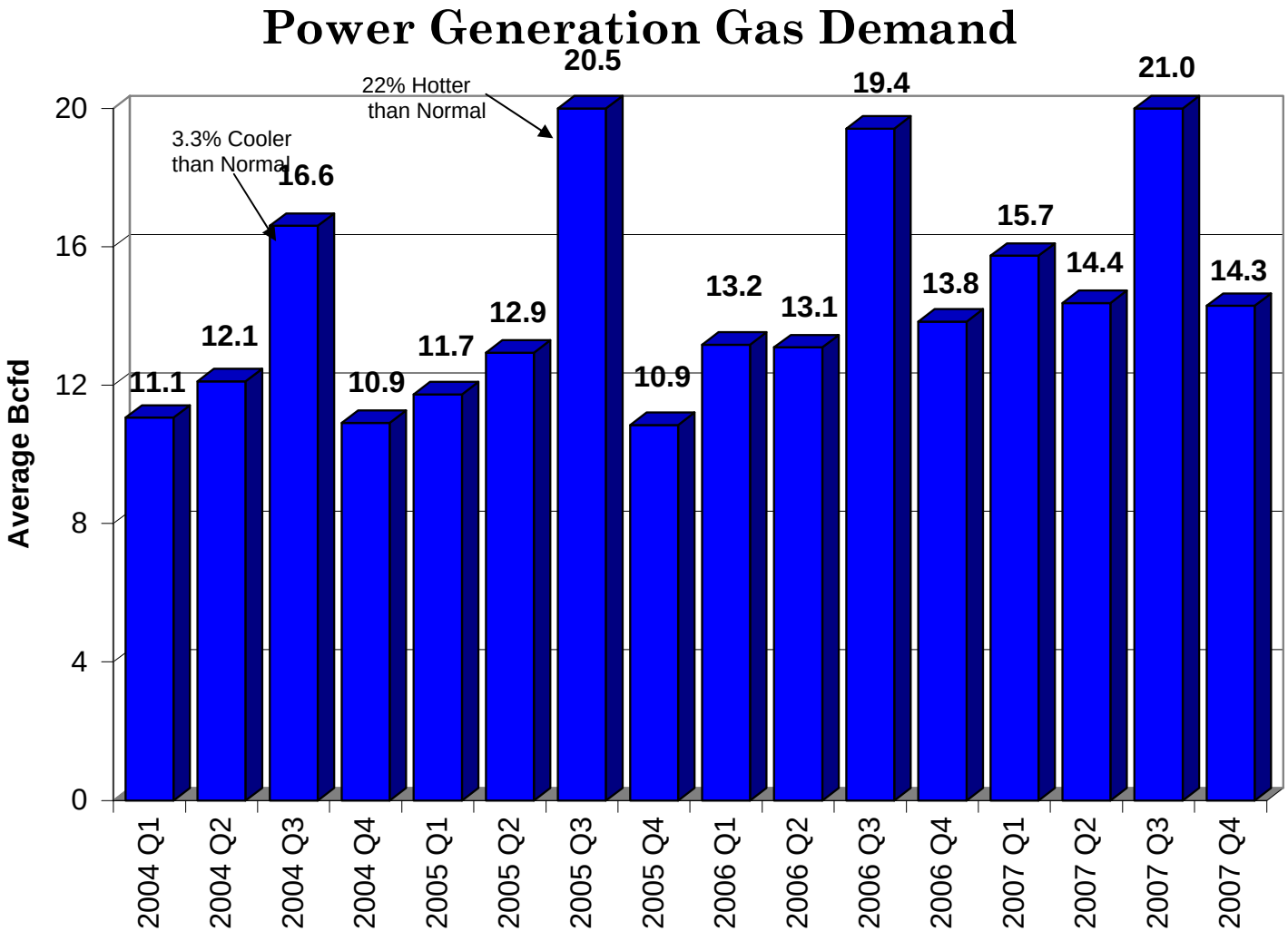
2) The information included in this presentation is our “best estimate” at this time. A slower recovery scenario for Gulf Coast supplies than what is applied herein would lead to higher gas prices and greater demand destruction. Under some scenarios where much of the gas supply that is currently off-line remains out of service for most of the winter, load curtailment could be required even under normal weather conditions.

Review of Recent History (Summer Weather)

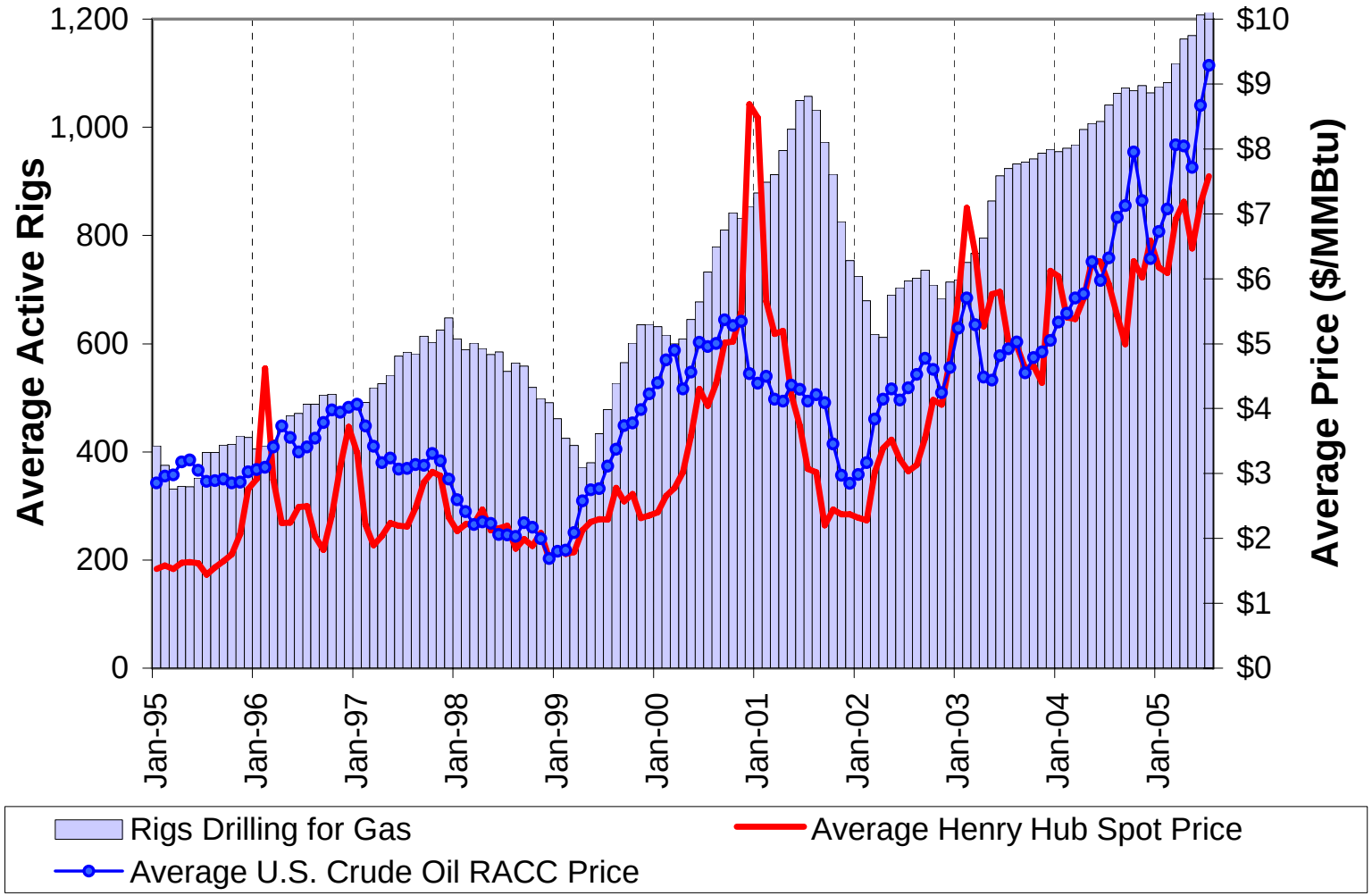
- Hotter than normal summer temperatures have kept upward pressure on gas prices.
- An early summer heat wave covered the Midwestern and Central states in June.
- July provided extreme heat to the Western United States.
- Late summer included more heat, with South Atlantic and Gulf Coast states seeing the hottest summer in ten years.

U.S.	2005 CDD	Normal	% Different
June	260	213	22%
July	367	321	14%
August	348	290	20%
MATL			
June	205	117	75%
July	309	247	25%
August	306	205	49%
SATL			
June	335	319	5%
July	462	425	9%
August	451	393	15%
ENC			
June	249	147	69%
July	294	245	20%
August	258	197	31%
ESC			
June	335	296	13%
July	433	412	5%
August	457	376	22%
WSC			
June	482	431	12%
July	558	545	2%
August	575	527	9%
PAC			
June	92	100	-8%
July	239	188	27%
August	223	193	16%

Summer Weather and Gas Use in Power Plants



U.S. Gas Directed Drilling Activity and Crude Oil and Gas Prices

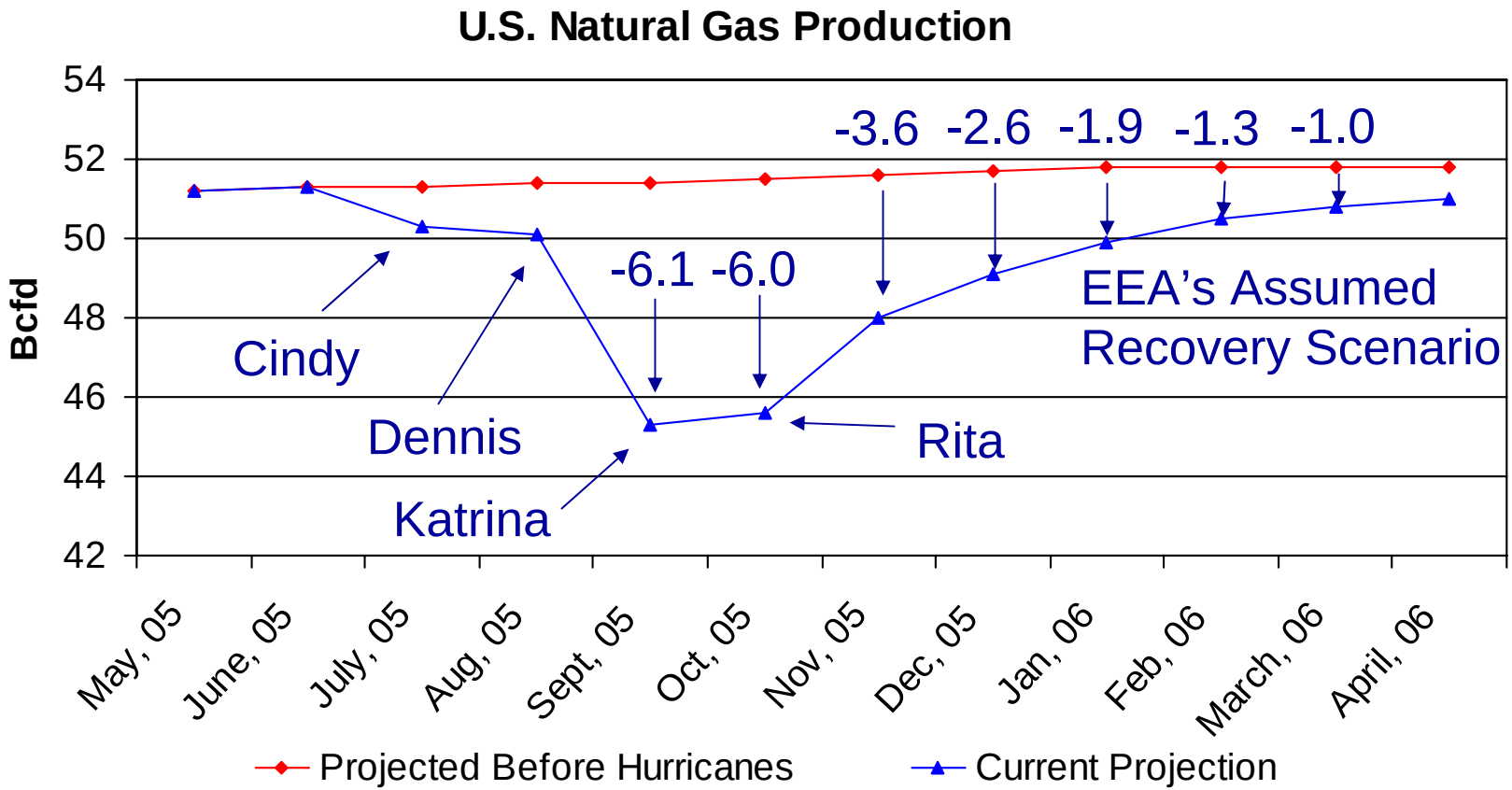


Hurricane Impacts

Supply disruptions due to recent hurricanes will persist throughout the upcoming winter …

Cumulative production offline from September through March = 680 Bcf (about 6% of Total US Production)

Average production offline during the upcoming winter = 2.0 Bcfd (about 4% of Total US Production)



U.S. Storage Working Gas Levels (Bcf)

Hurricane-related supply disruptions have derailed storage refill …

… hence, U.S. working gas will rise to 3.09 Tcf by November 1st, below the 3.26 Tcf level we were expecting before the hurricanes.

Injections in Sept-Oct down by about 2.5 Bcfd.

	5-Yr Average	Projections: Before Hurricanes	Projections: After Hurricanes	Difference (After less Before)
July, 05	2,265	---	---	
August	2,545	2,706	2,682	-24
September	2,876	3,034	2,922	-112
October	3,085	3,259	3,092	-167
November	2,981	3,161	2,992	-169
December	2,451	2,604	2,475	-129
January, 06	1,775	1,826	1,749	-77
February	1,264	1,329	1,333	4
March	1,066	1,074	1,103	29

Lower storage refill will continue to place upward pressure on near-term gas prices.

Note: End of month values. Source of Historical Data: *DOE Energy Information Administration NGM*.

U.S. Gas Supply/Demand Balance for the Injection Season (Bcfd)

Story Line

1) Hurricane Ivan disrupted an average of 0.5 Bcfd of gas production during last year's injection season. Recent hurricanes have disrupted an average of 2 Bcfd of gas production during this injection season.

2) Canadian and LNG imports have been about the same from one year to the next.

3) Gas use in power plants up by 15% this injection season due to hotter than normal weather.

4) Recently, industrial gas consumption off due to increasing gas prices.

5) Recent storage injections off due to Gulf Coast supply disruptions.

	2004	2005
Gas Demand	60.2	59.0
R/C Gas Use	11.1	11.4
Industrial Gas Use	19.6	18.0
Power Gas Use	13.9	15.9
Other Gas Use	4.9	4.9
Net Injections	10.8	8.7
Gas Supply	60.7	59.6
U.S. Production /1,2	50.6	49.4
Net Imports	10.1	10.2
Net Withdrawals	NA	NA
Balancing Item (S-D)	0.5	0.7

1. Includes impact of all recent hurricanes
2. Includes supplemental gas supplies.

Note: Data represents average day from the beginning of April through October.

Industrial gas use has declined and storage refill has lagged as a result of recent hurricane-related supply disruptions.

U.S. Gas Supply/Demand Balance for the Upcoming Winter (Bcfd)

Story Line

1) Recent hurricanes will reduce this winter's gas production by an average of 1.2 Bcfd versus last winter (or by 2 Bcfd from the expected productive capacity before the hurricanes).

2) Lower storage working gas levels will yield less storage for the market.

3) R/C and power plant gas use is likely to be up - last winter was 4 percent warmer than normal. Caveat: Media campaigns could create conservation not included in our projection.

4) Net imports are likely to be up - LNG imports up as deliveries from Egypt and Trinidad ratchet up. Canadian imports up due to normal weather assumption - last winter was colder than normal in Canada.

5) Declines in industrial gas use at relatively high prices will balance the market.

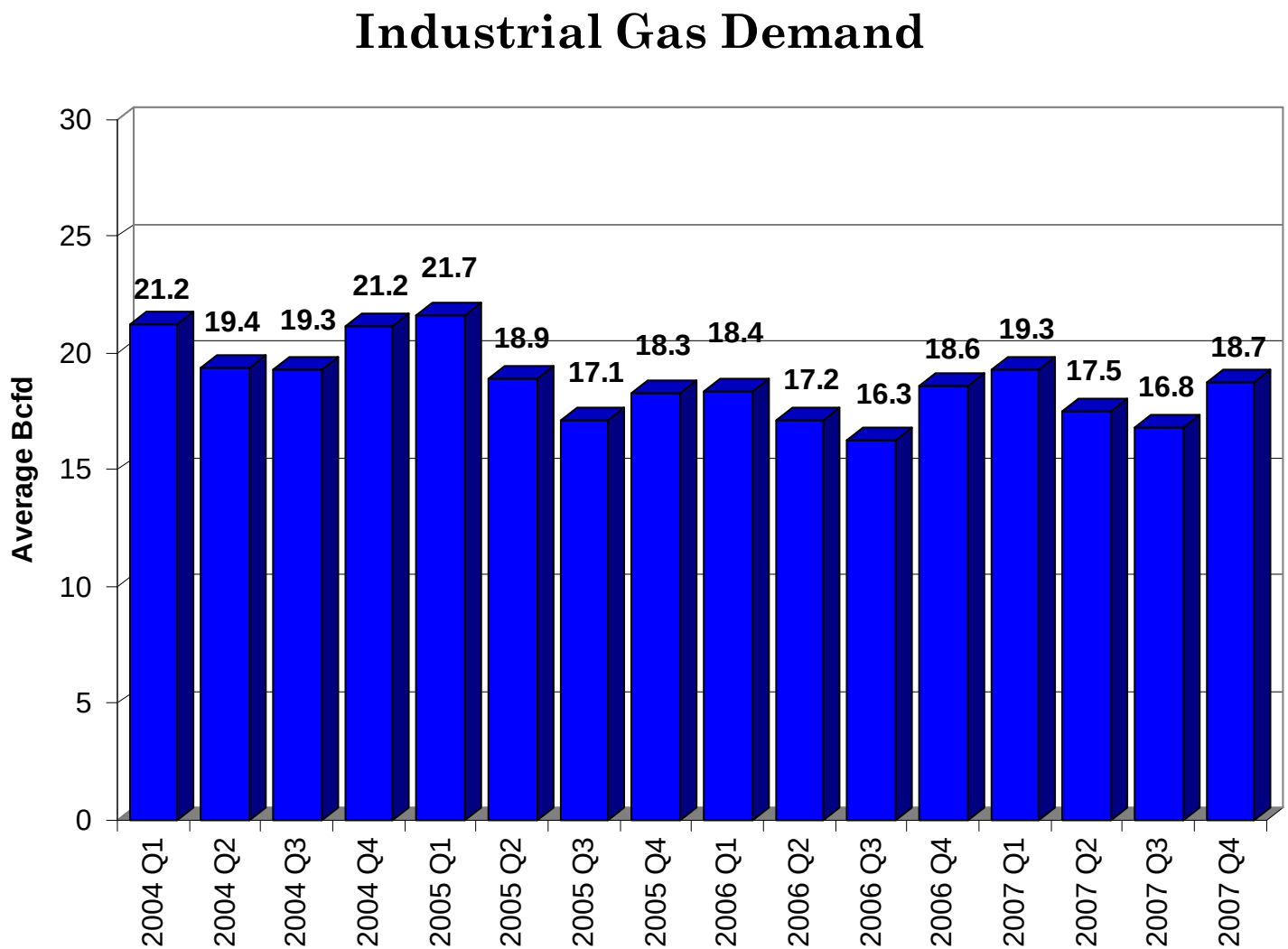
	2004-05	2005-06 /1
Gas Demand	73.8	73.2
R/C Gas Use	35.7	37.3
Industrial Gas Use	21.5	18.4
Power Gas Use	11.2	12.2
Other Gas Use	5.3	5.2
Net Injections	NA	NA
Gas Supply	74.3	73.8
U.S. Production /2,3	50.9	49.7
Net Imports	9.7	10.8
Net Withdrawals	13.7	13.3
Balancing Item	0.6	0.6

1. Normal winter weather assumed for 2005-06 winter.
2. Includes impact of all recent hurricanes
3. Includes supplemental gas supplies.

Note: Data represents average day from the beginning of November through the following March.

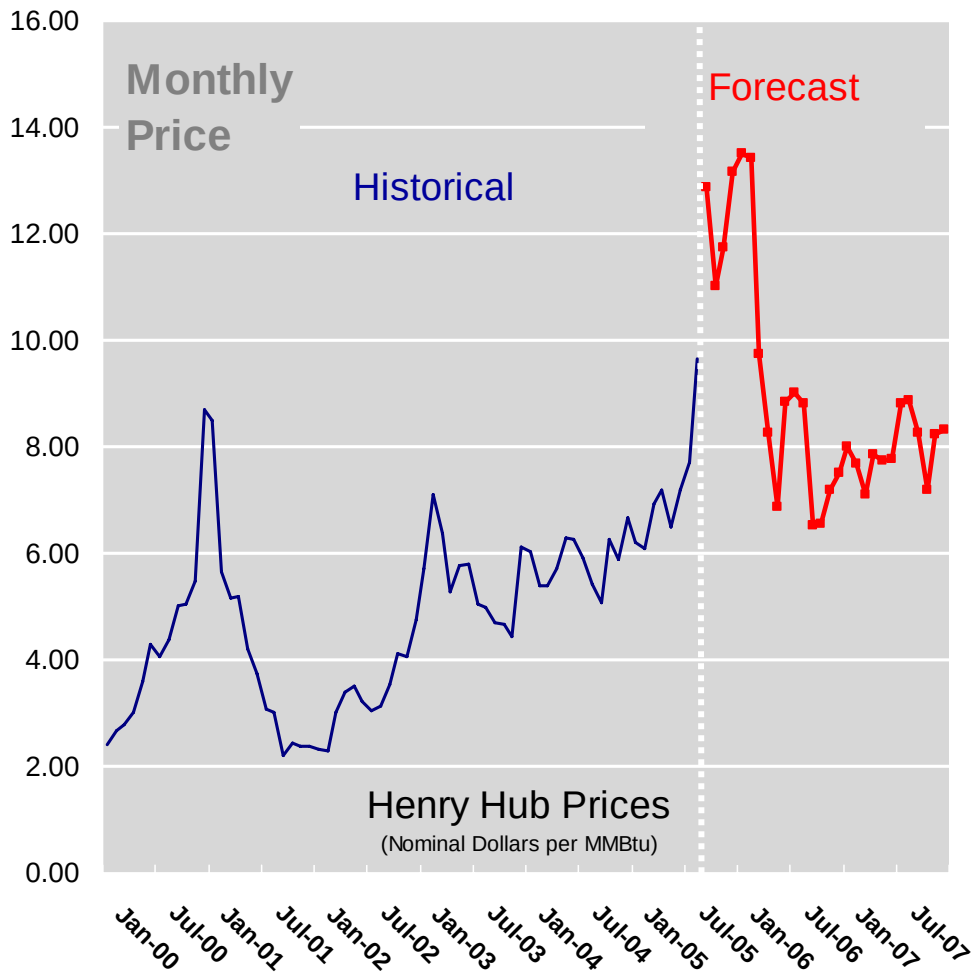
Declines in industrial gas use will balance the market this winter.

Balancing the Market



Henry Hub Gas Price

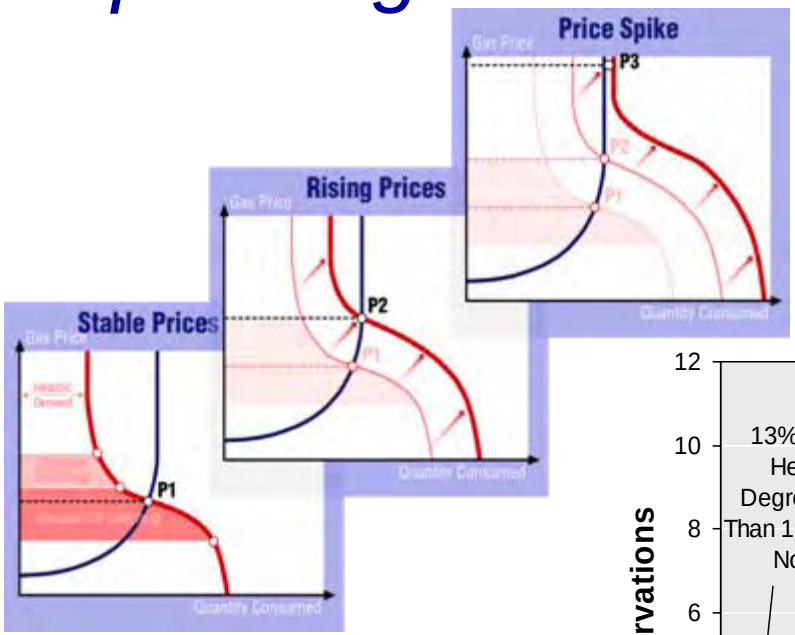
Assuming normal weather, Henry Hub prices will average about $13 per MMBtu this winter due to the persistence of the tight supply/ demand balance.



Source of Historical Data: *Platts Gas Daily.*

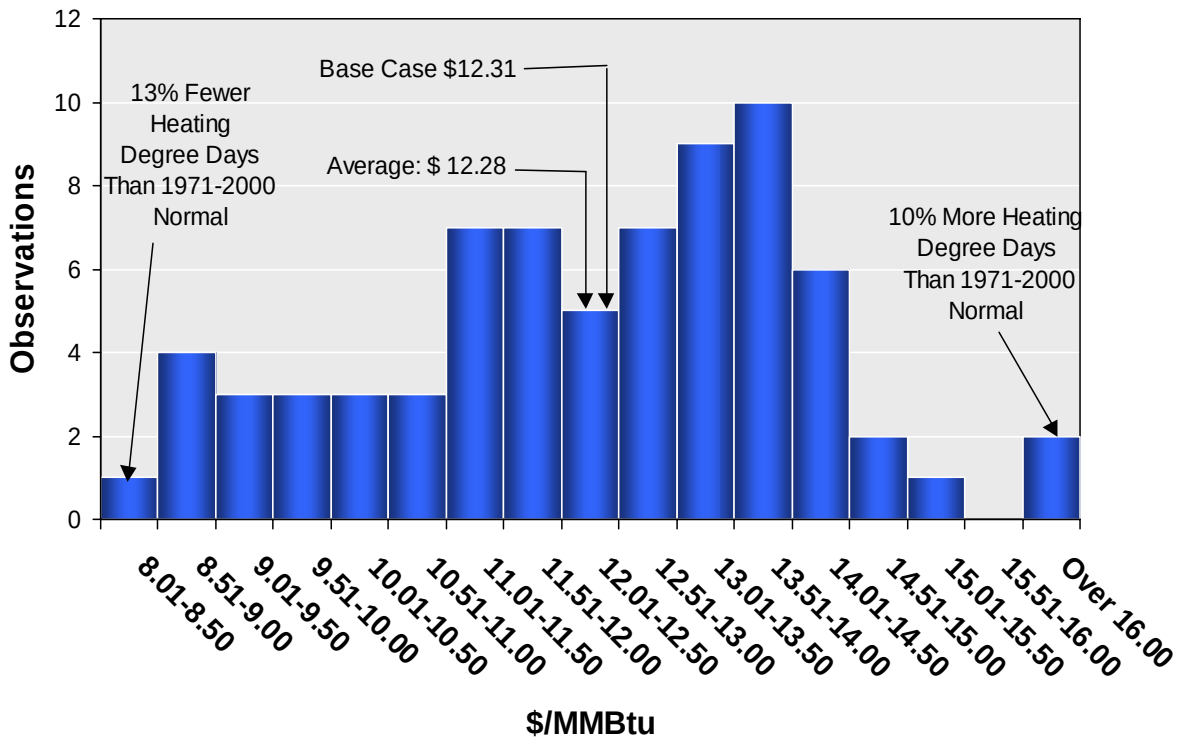
Gas Prices

Expect Significant Price Volatility



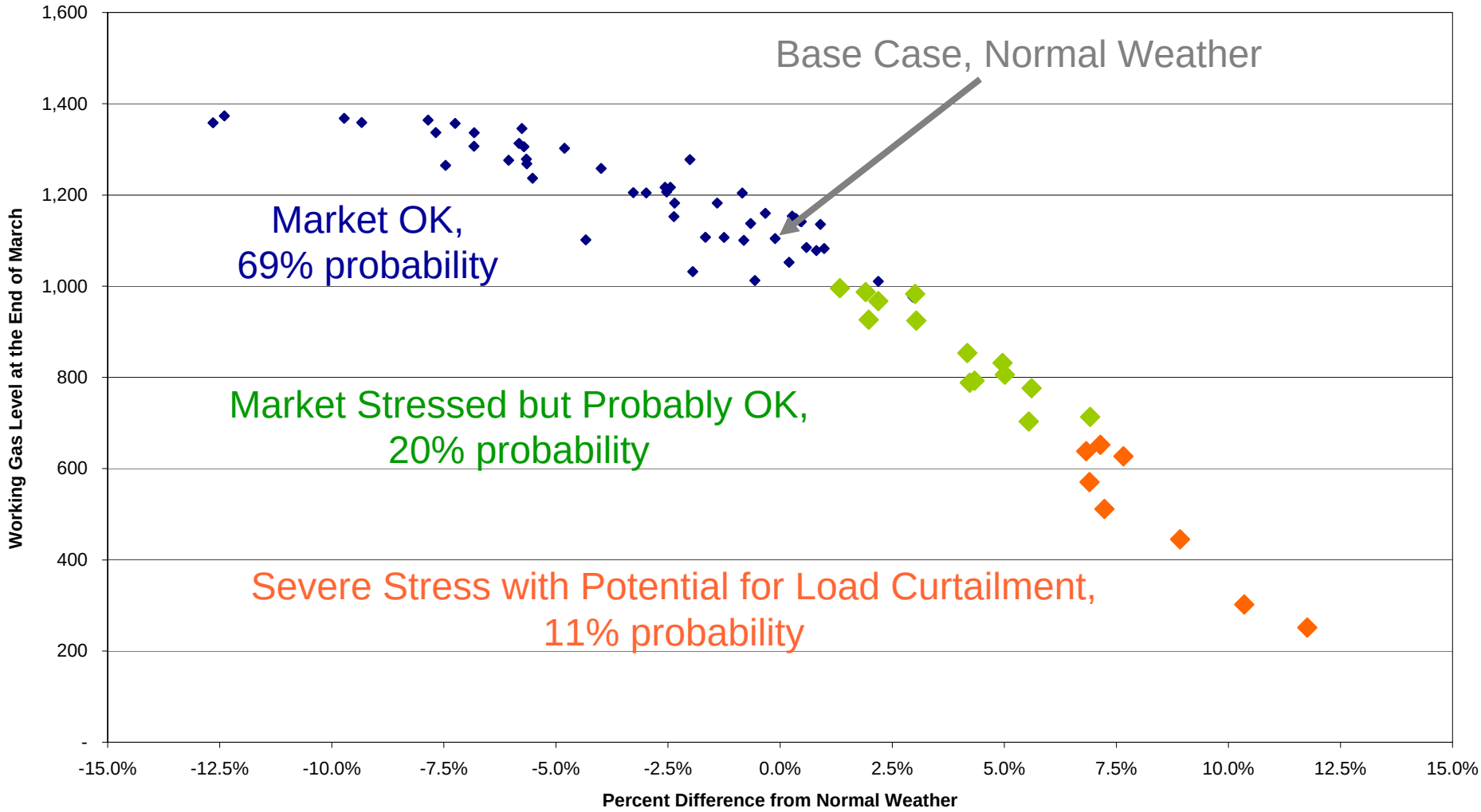
Changes in weather shift daily demand, causing wide swings in gas prices.

Projected Henry Hub Price Distribution for November 2005 Through March 2006



Significant price volatility expected due to daily shifts in the demand curve.

U.S. Working Gas Level Versus Weather
(March 31, 2006 Level, Bcf)



Is Gas Supply Adequate to Meet Demand During the Upcoming Winter?

Depends on weather ...

- Hurricane-related supply disruptions have tightened the supply/demand balance beyond what it was a year ago.
- Recovery of currently unavailable supplies in the Gulf Coast is critical.
  - Expeditious repair of production facilities and processing plants is critical.
- In the short run, supply balances with demand mostly because of demand-side changes.
  - Fuel switching, shut down of facilities, and conservation.
  - Market will likely remain in balance this winter as a result of demand destruction at relatively high gas prices.
- A winter that averages 6% or more colder than normal would strain the market to the point where load curtailment and allocation of supplies using regulatory mechanisms may be necessary - depends on specific weather conditions.

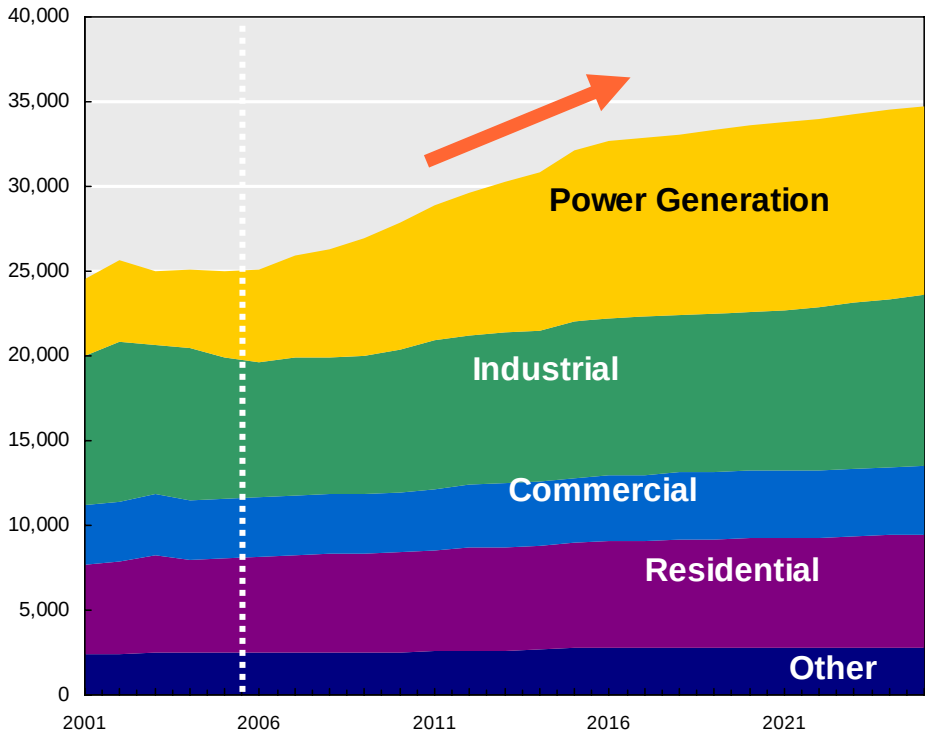
Looking to the Longer Term:
Have we changed our views as a result of recent market conditions?

Gas Demand Outlook

- Gas consumption in the power sector will grow substantially.
  - Over 200 GW's of new gas-based generating capacity in the U.S. will be used to satisfy increasing electric load.
- Modest growth in R/C gas consumption.
- Industrial gas consumption will fluctuate around current levels.
  - Well below pre-2000 levels.
- When necessary, price-induced demand reductions will balance the market.

U.S. and Canada Gas Consumption

(Trillion Cubic Feet, Tcf)



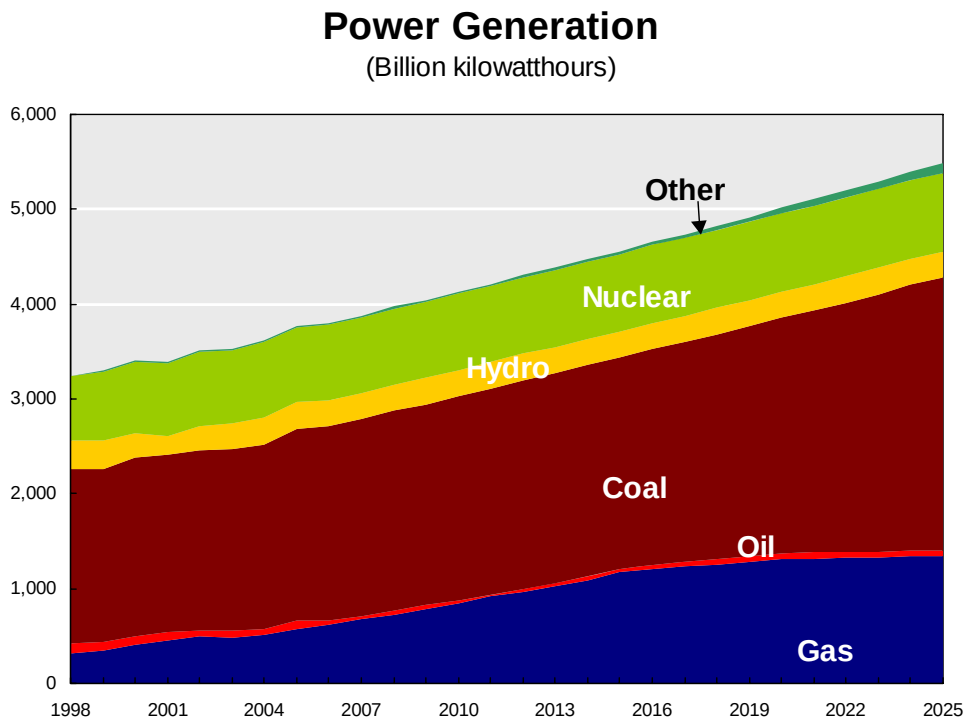
	Delta 2004-2015	Delta 2004-2025
Power Generation	+5.4 Tcf	+6.5 Tcf
Industrial	+0.2 Tcf	+1.1 Tcf
Commercial	+0.3 Tcf	+0.6 Tcf
Residential	+0.7 Tcf	+1.2 Tcf
Other	+0.3 Tcf	+0.3 Tcf

The North American gas market may be best characterized as a "demand leads supply market" for the foreseeable future.

1st Most Frequently Asked Question:

What Drives Growth in Power Generation Gas Use?

- More than 200 Gigawatts of gas generating capacity recently constructed.
  - Little switching capability.
- Electricity load has grown at about 2 percent per year during the past 15 years, a trend expected to continue.
- Coal generation expected to increase, but by only enough to satisfy 40 percent of growth in electric load.
  - Consistent with recent history.
  - Increases of output at existing coal plants limited by environmental regulations.
  - Significant additions of new coal capacity not expected during next 5 years.
- Nuclear and renewables output is expected to grow only slightly.



Gas-based capacity will satisfy a large part of the incremental growth in electricity load through the end of next decade.

2nd Most Frequently Asked Question:
Will Industrial Gas Use Fold at High Gas Prices?

Recent Gas Use, Bcf

Source: U.S. Energy Information Administration, NGA 2003

	Residential	Commercial	Industrial	Power Generation	Other	Total
1998	4,520	3,009	8,320	4,588	1,808	22,245
1999	4,726	3,045	8,079	4,820	1,736	22,405
2000	4,996	3,182	8,142	5,206	1,806	23,333
2001	4,771	3,023	7,344	5,342	1,758	22,239
2002	4,889	3,144	7,507	5,672	1,795	23,007
2003	5,078	3,217	7,139	5,135	1,806	22,375
2004	4,879	2,984	7,399	5,352	1,803	22,416
Annual Average	**4,837**	**3,086**	**7,704**	**5,159**	**1,787**	**22,574**
% of Total	**21%**	**14%**	**34%**	**23%**	**8%**	

Significant demand destruction has already occurred.

Only 40% of the industrial sector's gas use will be subject to additional demand destruction.

Gas Use by Type of Industry, Bcf

Industry	*Gas Use in 2003 (Bcf)*	*Percent of Total Industrial Gas Use (%)*	*Gas Share of Value Added (%)*
Chemicals (all chemicals except ammonia production)	2,134	30	13
Ammonia Production	329	5	80
Refining	1,307	18	8
Pulp and Paper Products	596	8	6
Food Processing and Manufacturing	585	8	3
Iron, Steel, Aluminum, Other Metals	337	5	6
Stone, Clay, and Glass	339	5	2
All Other Manufacturing and Non Manufacturing	1,576	22	2

Source: Energy and Environmental Analysis, Inc.

Additional demand destruction is likely at current price price levels, however, longer-term moderation of prices should yield less demand destruction.

The Fundamental Question:
"Can Gas Supply Support a Growing Market?"

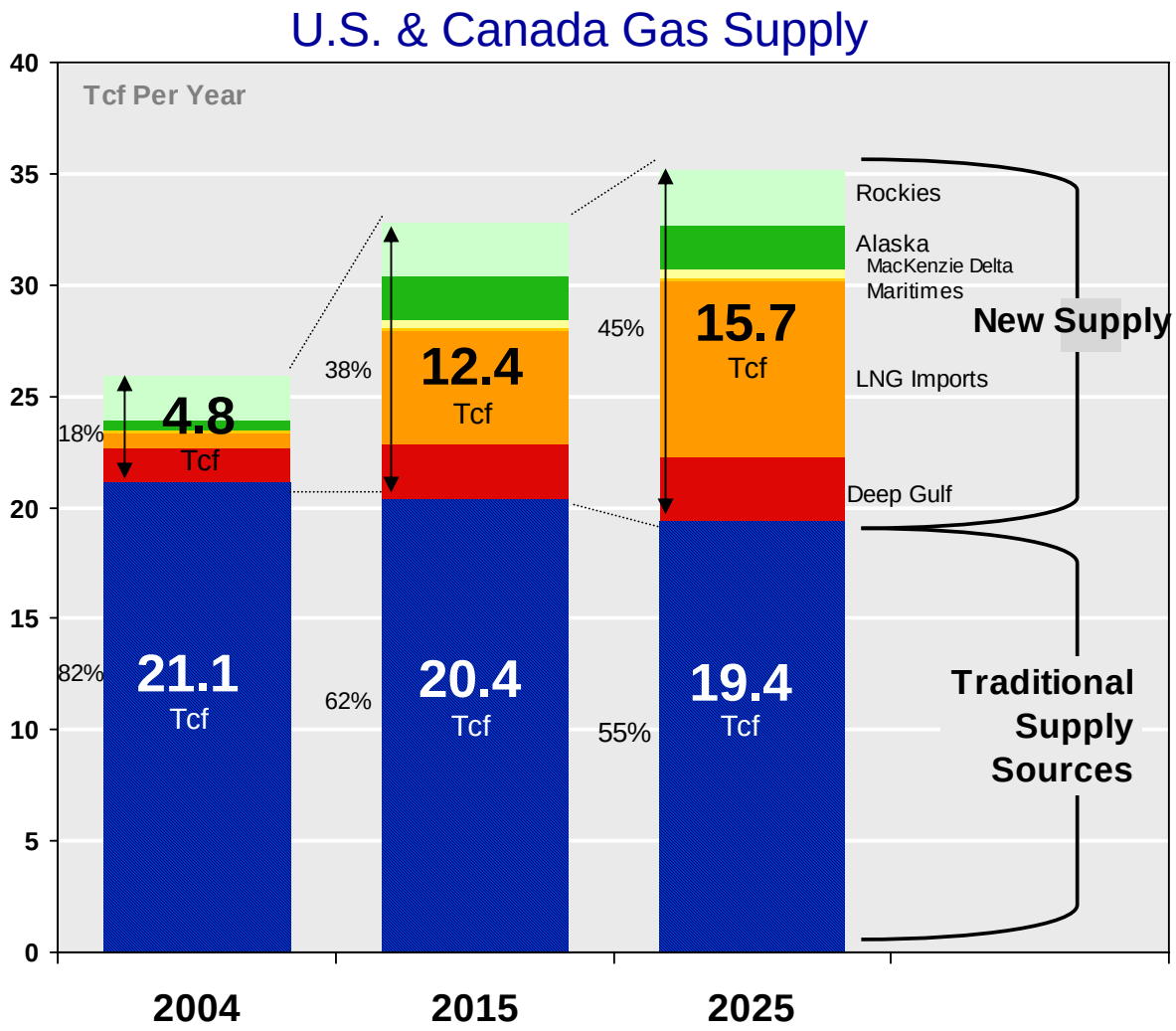
Yes!

- Sufficient gas resource is available in North America and around the world.
- These resources can be developed and delivered to the North American market at prices that will allow gas demand to continue to grow.
- ***But not without the construction of new facilities to access and deliver new frontier gas supplies.***
  - ***Pipelines, storage, and LNG infrastructure.***
  - ***These projects have long lead-times and require large capital investments.***

Natural Gas Supply

Relying On New Frontiers

- Production from mature producing areas will decline by about 1% per year.
- New frontier supplies will account for 38% and 45% of total U.S. and Canada gas supply in 2015 and 2025, respectively, versus only 18% today.



Obstacles For Supply Growth

- Large Capital Requirements
- Recent Liquidity Crunch
- Investor Recognition of Opportunities
- Price Volatility Creates Uncertainty
- Uncertainty About Future Gas Demand
- Access Restrictions
- Cumbersome Approvals Process
- Environmental and Siting Issues
- Contracting Issues

There is much uncertainty about future gas supply development.

Regional Gas Supply (TCF/year)

Canada declines even with MacKenzie Delta and coalbed methane.

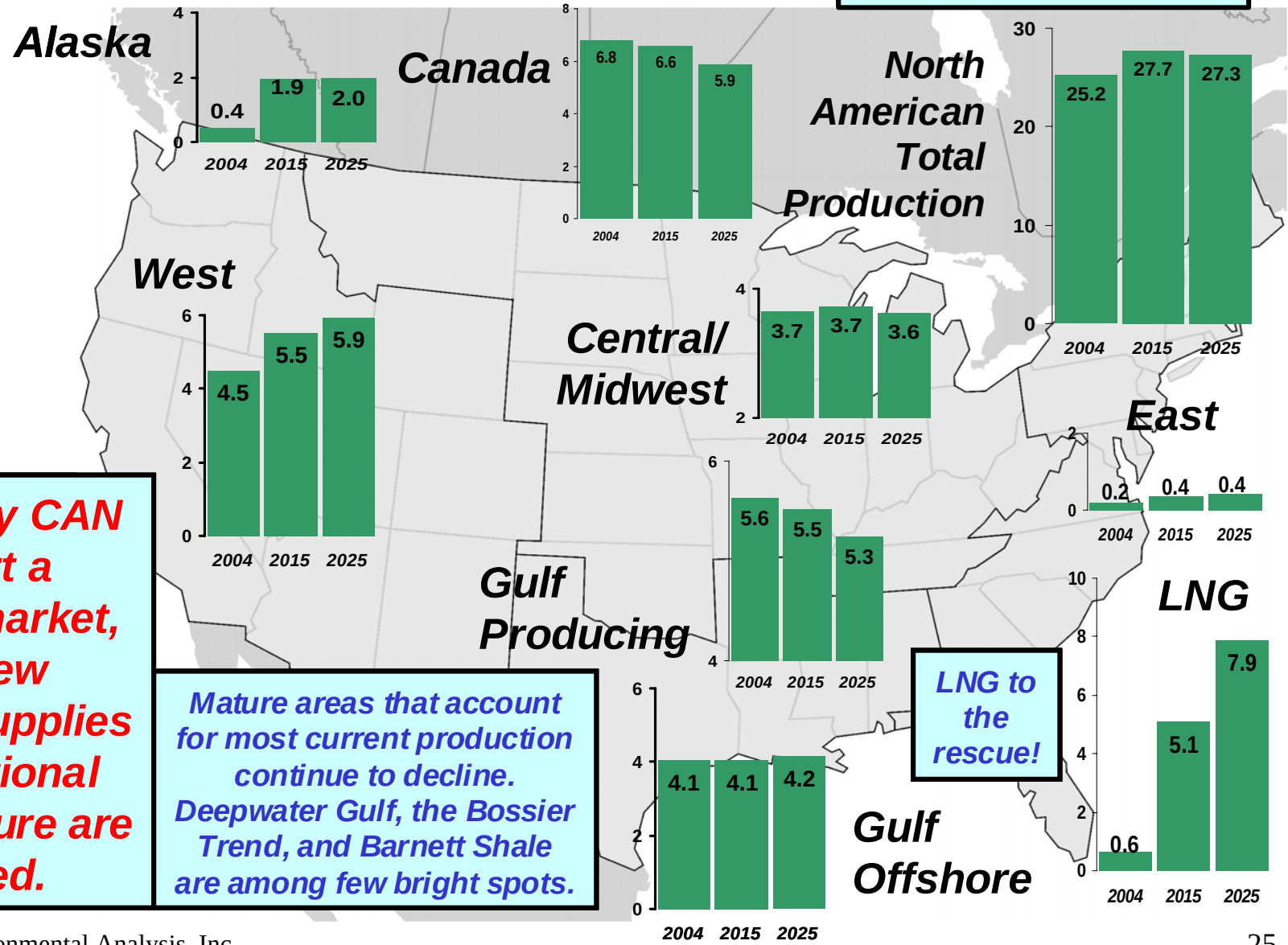
Alaska always 10 years out - but needed.

The Rocky Mountain Basins continue to shine.

Gas supply CAN support a growing market, but "new frontier" supplies and additional infrastructure are required.

Mature areas that account for most current production continue to decline. Deepwater Gulf, the Bossier Trend, and Barnett Shale are among few bright spots.

LNG to the rescue!

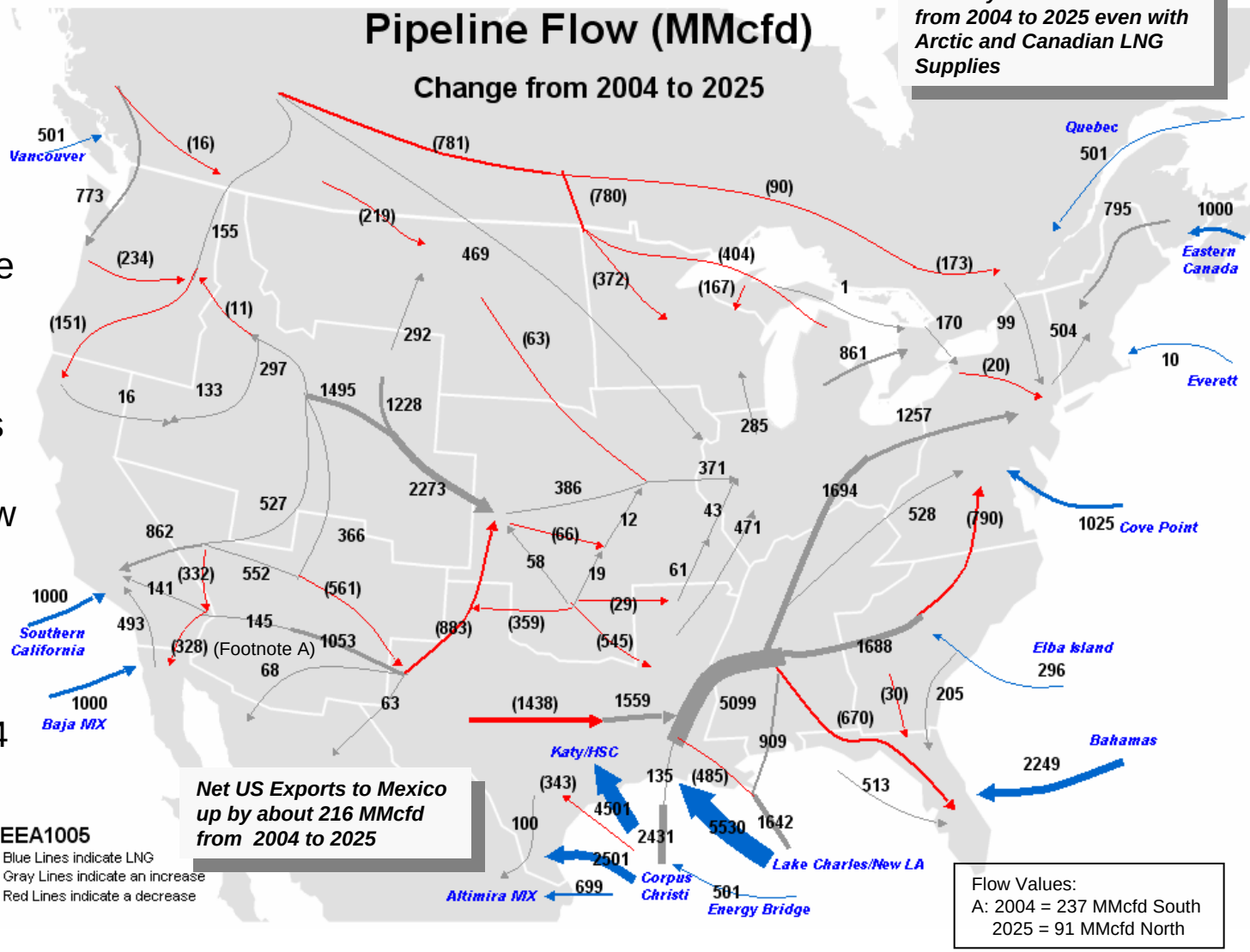


New Gas Supplies Affect Regional Flow Patterns

2004-2025

- Greatest increases in supply are from LNG Imports, the Deep Gulf, and the Rockies.
- Exports from Western Canada are not much different over time despite Alaskan and Canadian Arctic gas development.
- Eastern Canada flow increase attributed to LNG imports.
- U.S and Canada. LNG imports increase to about 24 Bcfd by 2025.
- Location of LNG terminals will affect flow patterns.

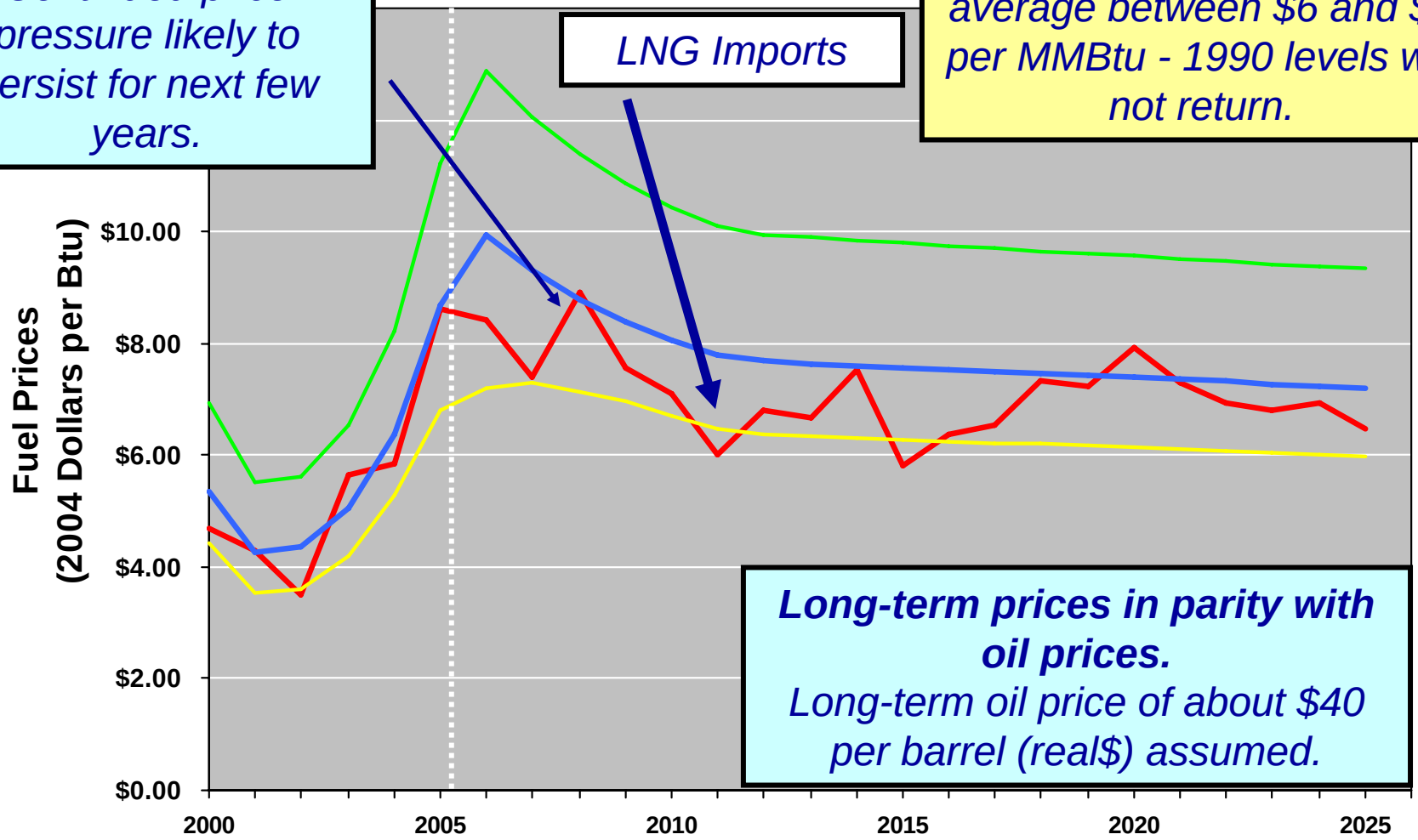
Net US Imports from Canada down by about 5 Bcfd from 2004 to 2025 even with Arctic and Canadian LNG Supplies



Projected Annual Average Henry Hub Gas Price

Continued price pressure likely to persist for next few years.

Henry Hub gas prices will average between $6 and $9 per MMBtu - 1990 levels will not return.

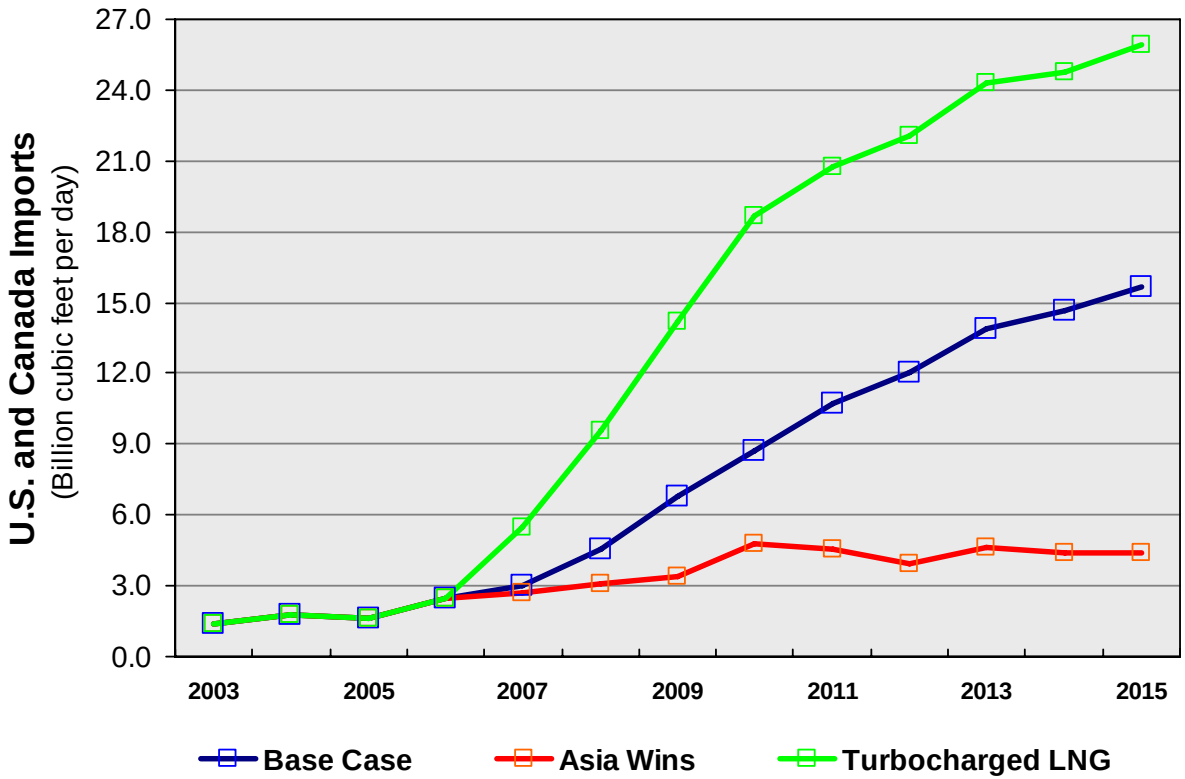


Long-term prices in parity with oil prices.
Long-term oil price of about $40 per barrel (real$) assumed.

Sources: Historical data from Platts Gas Daily, Projection by Energy and Environmental Analysis, Inc.

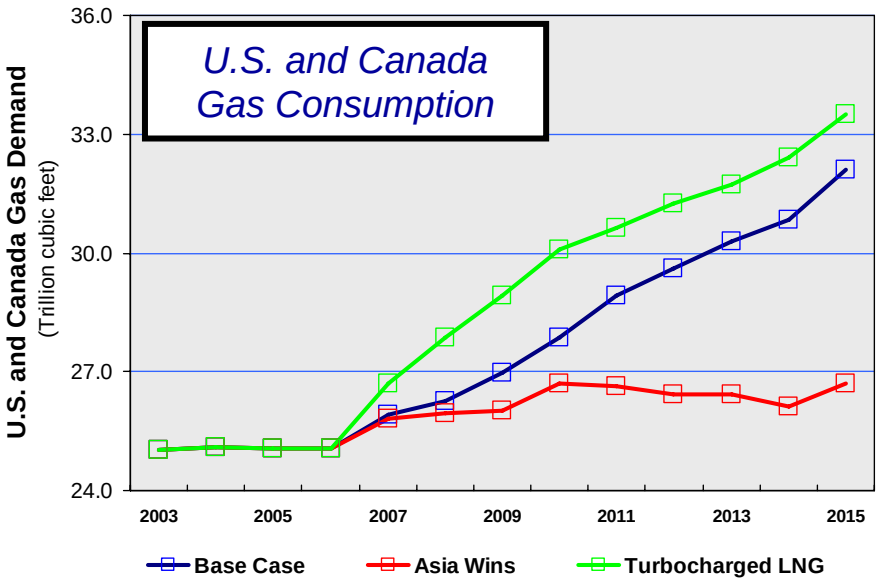
LNG Imports - A Wildcard

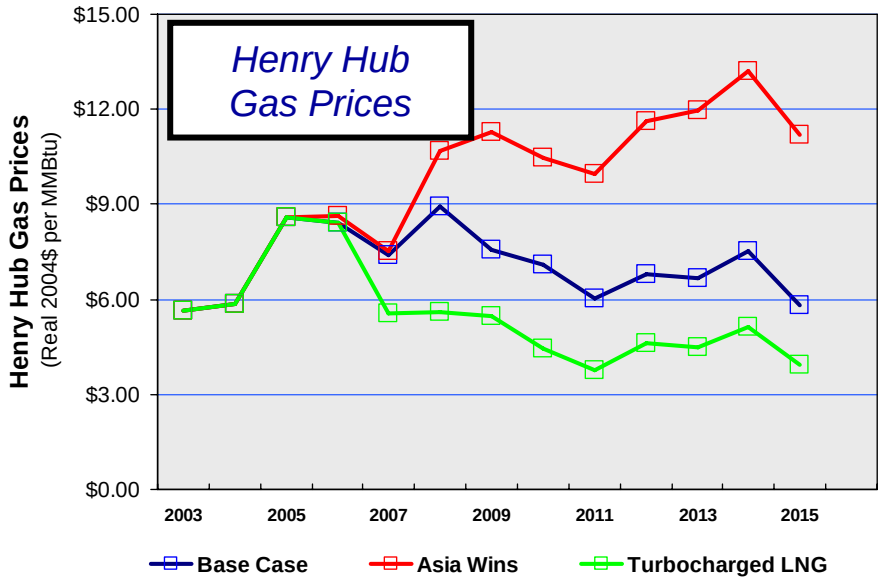
- LNG imports will likely become the most important determinant of market conditions in the next 10 years.
- Many different scenarios are possible:
  - "Asia Wins" - LNG Supply to U.S. is limited by demand growth elsewhere.
  - Base Case - Approximately 16 Bcfd of imports by 2015.
  - "Turbocharged LNG" - 10 Bcfd of LNG added to the Base Case by 2015.



Gas Demand and Prices with Different Levels of LNG

- Different levels of LNG import yield very different "worlds" over time.
- Excessively high growth of LNG imports in the Gulf Coast may push gas prices at Henry Hub down toward $4 and push domestic supplies out of the market.
  - Gulf Coast infrastructure will be a constraining factor and localized price depression is likely in high import scenarios.
- Little growth in LNG imports would constrain the market, keeping demand near today's level and yielding $10+ gas at Henry Hub.
  - Expect healthy market growth in both the Base and Turbocharged cases.





Conclusions

Conclusions

- The near-term gas supply/demand balance is very tight.
  - *Market will balance through demand destruction, mostly in the industrial sector this winter.*
- Assuming normal weather, Henry Hub prices will average about $13 per MMBtu during the winter.
- High levels of gas price volatility are likely.
- A winter that is, on average, *6% or more* colder than normal may require load curtailment and allocation of supplies using regulatory mechanisms.

- Our views on long-term trends haven't changed much, despite dramatic changes in near-term trends:
  - Gas use in power plants likely to increase significantly, however, persistence of high gas prices would change this view.
  - Gas supplies from new frontiers, particularly LNG imports are needed.
  - Gas prices likely to average between $6 and $9 per MMBtu - level is dependent on oil prices and LNG imports, among other factors.

EEA thanks the U.S. Department of Energy (DOE) Office of Electricity Delivery and Energy Reliability, Office of Energy Assurance (OEA), the National Energy Technology Laboratory (NETL), the Energy Information Administration (EIA), and the National Association of State Energy Offices (NASEO) for the opportunity to have presented its views on the North American gas market.

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