

# **2005 North American Natural Gas Outlook**

*Client Presentation*

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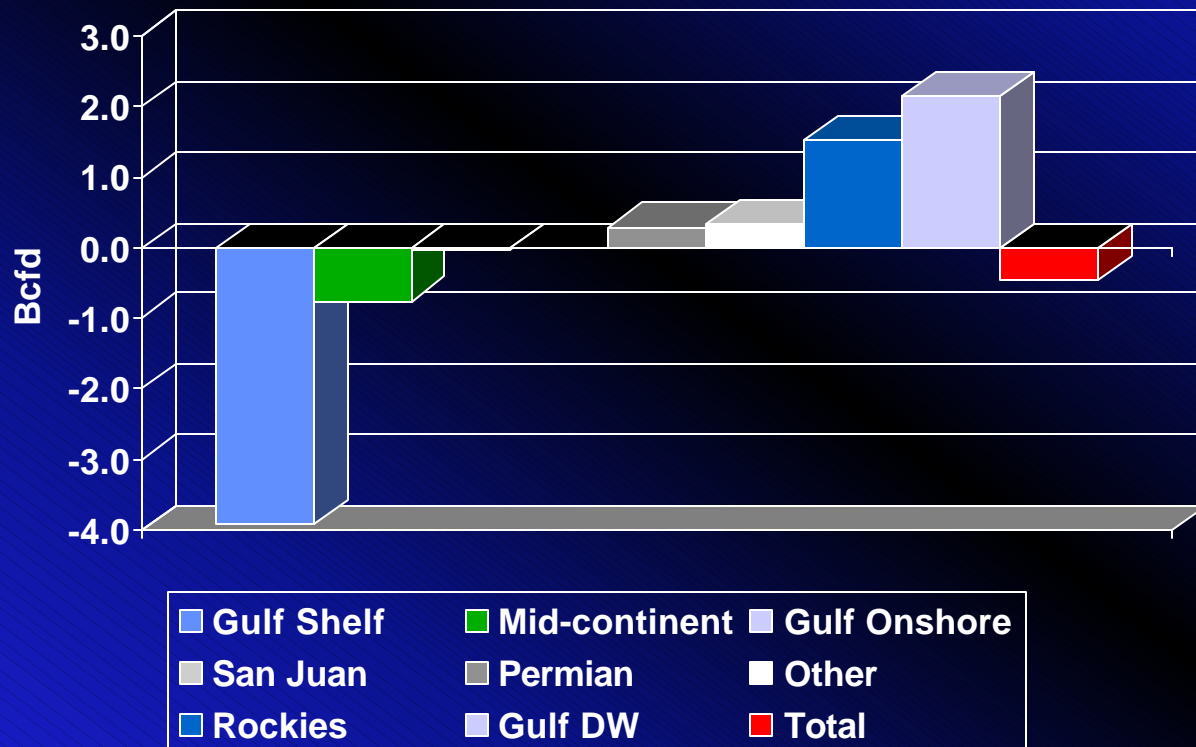
# Outline

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- **Natural Gas Supply Outlook (Annual)**
- **Summer Demand and Supply**
- **Price Outlook and Risks**

US production has been declining as growth in the Deepwater and the Rockies has been more than offset by declines on the shelf and other areas. US consumption is about 62 Bcf/d and expected to grow 1% to 2% per year.

Change in US gas Production 1998 - 2003



# North American natural gas production– who do you believe?

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- **Raymond James – expects YOY declines in US production of 2% to 4% per year for the foreseeable future. (August 2004)**  
**Raymond James assumes that quarterly financial report data is a good indicator of US production. SEER has shown that the data understates production growth.**
- **BENTEK’s model of North America supply and demand predicts a gas surplus of almost 1.9 BCFD by late 2005. With normal weather, BENTEK expects to see gas prices in the low \$3.00s by fall of 2005. (December, 2004)**
- **EIA shows YTD production September down .7% but after adjustment for statistical error and hurricane Ivan production is flat. EIA projects 1.9% production growth in 2005 on a Bcfd basis.**
- **SEER expects production to increase .8% in 2005 and 2006.**

# The Deepwater and Rockies will be the primary sources of US production growth.

	<u>US Production Bcf/d</u>					<u>Change</u>	
	<u>2003</u>	<u>2004</u>	<u>2005</u>	<u>2006</u>	<u>2007</u>	<u>03-04</u>	<u>04-05</u>
Gulf Deepwater	3.9	3.8	4.1	4.6	4.7	-0.1	0.3
Gulf Shelf	9.5	8.4	7.6	6.8	6.1	-1.1	-0.8
Gulf Onshore	12.1	12.1	11.8	11.6	11.6	0.0	-0.3
Mid-Continent	7.3	7.4	7.6	7.3	6.9	0.1	0.2
Permian	4.5	4.5	4.6	4.6	4.6	0.0	0.1
Rockies	7.2	7.5	8.1	8.8	9.5	0.4	0.6
SJ	3.3	3.3	3.4	3.4	3.4	0.0	0.0
<u>Other</u>	<u>4.1</u>	<u>4.2</u>	<u>4.3</u>	<u>4.9</u>	<u>5.0</u>	<u>0.1</u>	<u>0.1</u>
<b>Total</b>	<b>51.8</b>	<b>51.2</b>	<b>51.5</b>	<b>52.0</b>	<b>51.8</b>	<b>-0.6</b>	<b>0.3</b>
<b>%Change</b>	<b>-0.3%</b>	<b>-1.1%</b>	<b>0.5%</b>	<b>1.0%</b>	<b>-0.4%</b>		

# **Increased production will come from tight gas, coal bed methane, shale and deepwater.**

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- **Tight Gas (3 Bcf/d): Green River tight gas in WY (Jonah and Pinedale), Mamm Creek and Rulison in Colorado, Natural Buttes in Utah, Bossier (TX) and Vernon (LA).**
- **Coal Bed Methane (5 Bcfd): Deeper Big George coals in the Powder River will offset declines in Wyodak coals.**
- **Shale gas production will grow from 1.5 to 2.0 Bcfd by 2006 (primarily Barnett shale in North Texas).**
- **Substantial deepwater additions in late 2004 and early 2005.**

# Major pipeline expansions are coming from the Rockies. Over 2 Bcfd is targeted for eastern markets.

Pipeline	Origin	Destination	Capacity Addition (MMcfd)	Date	Status
Cheyenne Plains	Cheyenne, WY	Greensburg, KA	576	Dec-04	Operating
Cheyenne Plains	Cheyenne, WY	Greensburg, KA	179	Mar-06	Applied
Entrega	Pieance Basin, NW CO	Northeast CO	1300	Fall 2005	Applied
Ken River	Opal WY	S. CA	500		Under Consideration

**Production growth, increased imports and high storage levels should provide substantial supply growth in 2005.**

	US Supply (Billon Cubic Feet / Day)					Change	
	<u>2003</u>	<u>2004</u>	<u>2005</u>	<u>2006</u>	<u>2007</u>	<u>03-04</u>	<u>04-05</u>
LNG	1.1	1.5	1.8	2.3	2.6	0.5	0.2
Canada	8.6	8.9	9.1	9.0	9.1	0.3	0.2
Mexico	<u>-1.1</u>	<u>-1.1</u>	<u>-1.0</u>	<u>-1.1</u>	<u>-0.9</u>	<u>0.0</u>	<u>0.1</u>
Net Imports	8.6	9.4	9.9	10.3	10.8	0.8	0.5
US Production	<u>51.8</u>	<u>51.2</u>	<u>51.5</u>	<u>52.0</u>	<u>51.8</u>	<u>-0.6</u>	<u>0.3</u>
Total Supply	60.4	60.6	61.4	62.3	62.6	0.2	0.8
%Change in Supply		0.3%	1.3%	1.5%	0.6%		

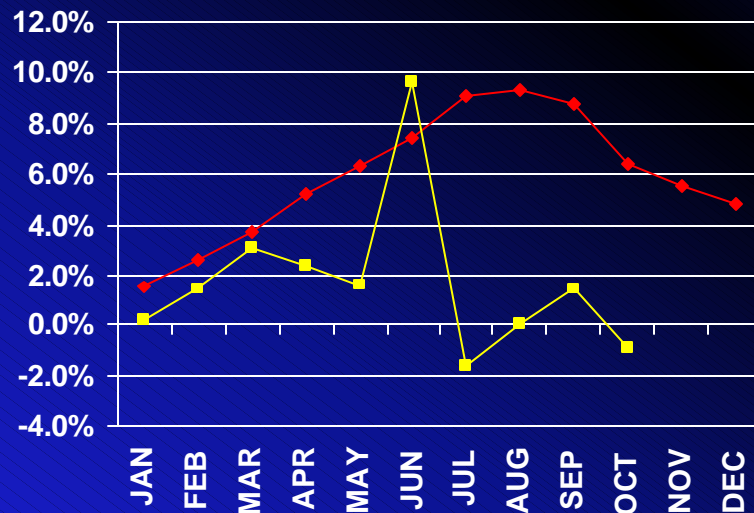


**Substantial LNG capacity is coming on but the US will have to rely on the spot market. 50% of Nigerian trains are contracted to the US.**

	<u>Quarter</u>	<u>MM</u>	<u>Bcfd</u>	<u>Destination</u>
<b>2004</b>				
Qatar Ragas Train3	Q1	4.7	0.6	India's Petronet
Australia NW Shelf Train 4	Q3	4.2	0.6	China, Japan, S. Korea
<b>Total</b>		<b>8.9</b>	<b>1.2</b>	
<b>2005</b>				
Egypt Damietta Train 1	Q1	5.3	0.7	Spain
Qatar RasGas II Train 4	Q1	4.7	0.6	UK
Nigeria Train 4	Q2	4.0	0.5	Italy, Spain, US
Egypt Ikudu LNG Train 1	Q3	1.8	0.2	Gas de France
Nigeria Train 5	Q4	4.1	0.5	Italy, US
<b>Total</b>		<b>14.6</b>	<b>1.9</b>	

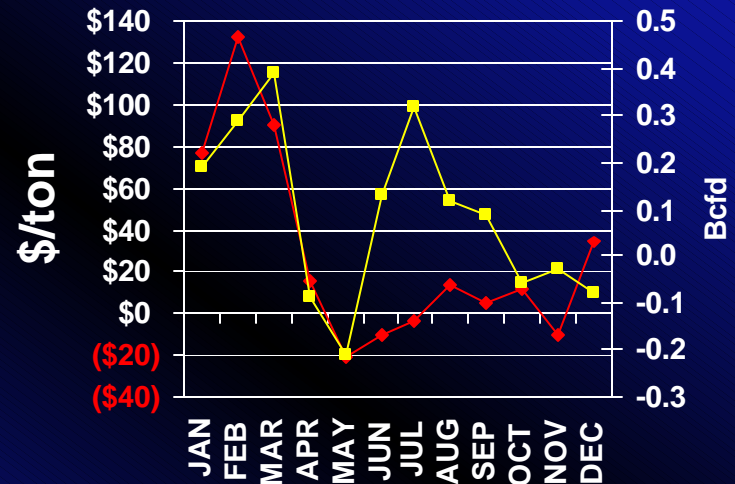
Despite strong production increases in gas intensive industries, EIA reported industrial gas consumption has averaged less than 2003 for the last four months. Gas consumption per output has decreased in all gas intensive industries.

YOY % Change in Industrial Gas Use vs Production Index



◆ Gas Intensive Production Index  
■ Ind. Gas Consumption

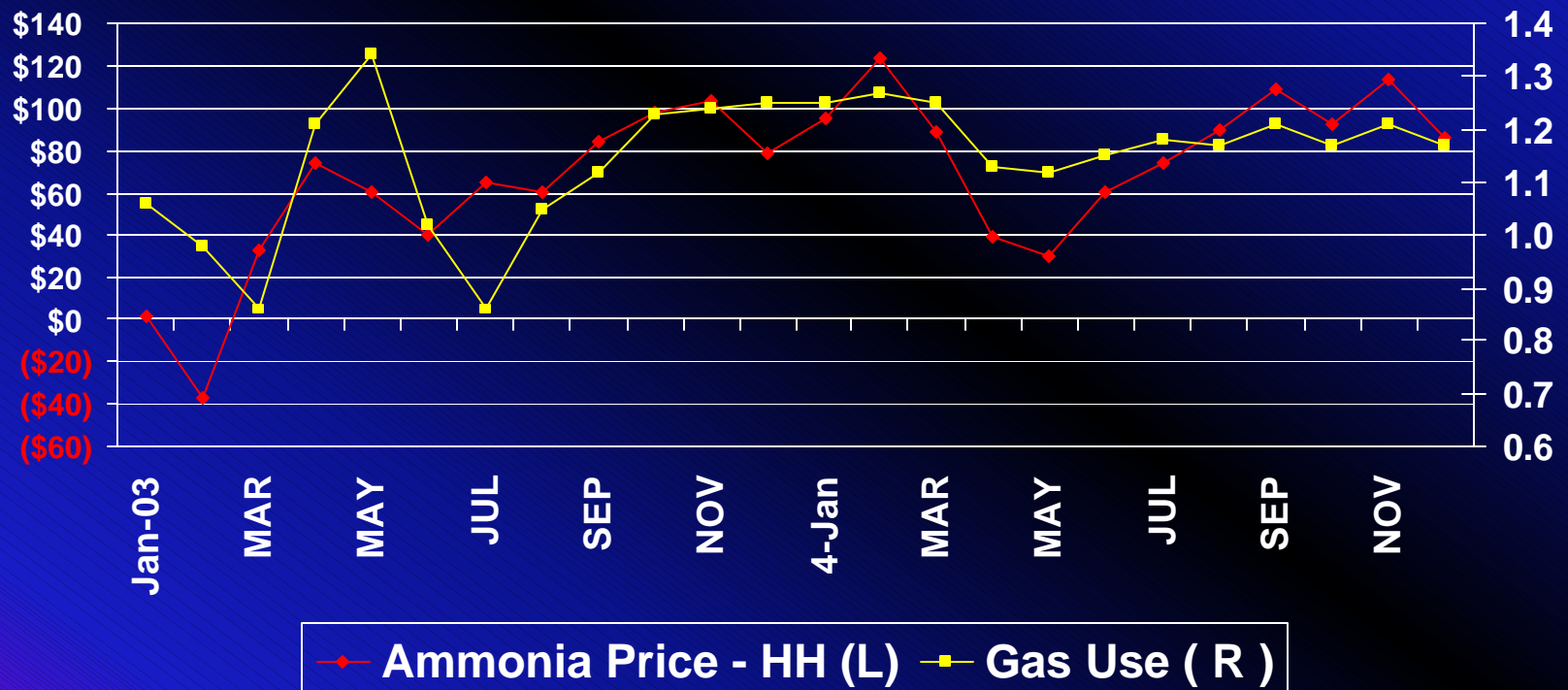
04-03 YOY Change in Ammonia Margin vs Gas Use



◆ Ammonia Price - HH (L)  
■ Gas Use ( R )

Gas use for the production of anyhdrous ammonia production was up 8% in 2004.

## Gas Use for Ammonia Production vs Margin



**March 31 working gas storage is likely to end above 5 year average (1040 Bcf) and last year (1058 Bcf).**

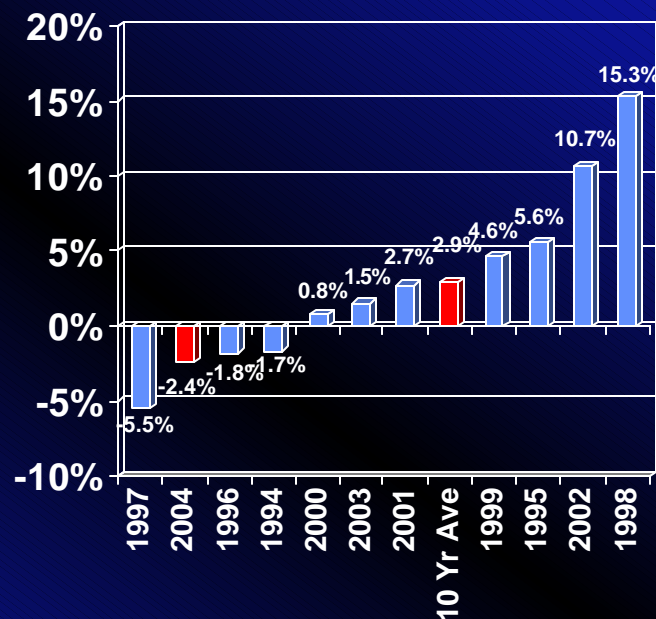
<b>HEATING DEGREE DAYS VS NORMAL</b>	<b>MARCH WORKING GAS STORAGE –BCF (1)</b>
<b>5% ABOVE NORMAL</b>	<b>1380-1480</b>
<b>NORMAL</b>	<b>1200 – 1300</b>
<b>5% BELOW NORMAL</b>	<b>1080 - 1180</b>

(1) Low is model forecast and high is model adjusted for average heating season statistical error. If storage remains above 5 year average, withdrawals per degree day are likely to increase.

During the non-heating season a 10% change in CDD would cause electricity demand to increase about 2% and gas consumption about 5%.

- During the last ten years CDDs have averaged 2.9% higher than the 30 year normal
- 2004 was 2.4% below the 30 year normal.
- The chances of exceeding normal CDDs by 5% or more is about 1/3.

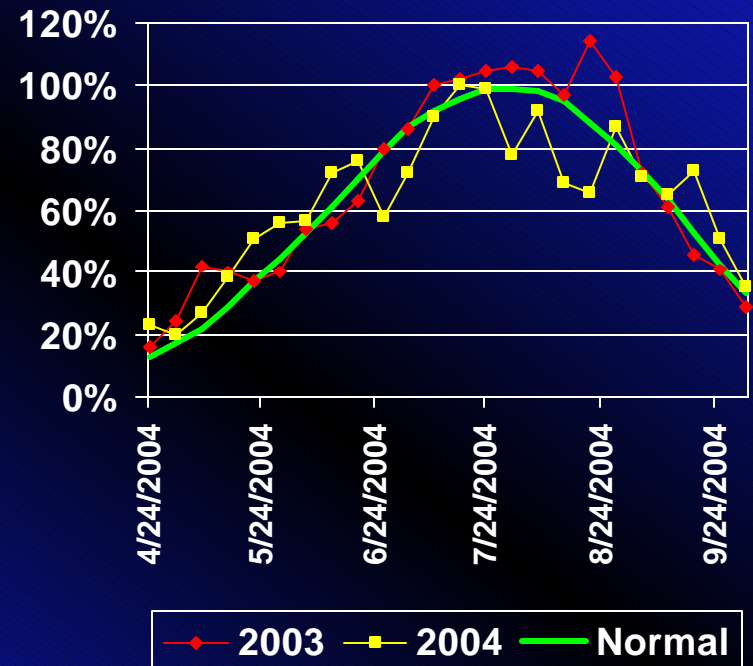
Population Wt. CDD  
(% of 30 Year Normal)



In the summer a 10% increase in CDD causes about a 3% increase in electricity consumption and a 7% increase in gas consumption (1.2 Bcfd),

- The crucial period is July and August (7/10 – 8/14).
- Gas is on the margin and inefficient units dispatch.
- During the peak demand period in 2003 gas weighted degree days were 9% below normal. In 2003 they were 6% above normal.

Gas Wt. CDD as % of Normal Maximum



# Weather, coal and hydro generation could sharply change gas consumption for power generation.

- Coal supply to the east is expected to gradually improve this year.
- A repeat of last year's hydro would add .5 Bcfd to gas demand and a normal hydro year would reduce gas demand by 1 Bcfd.
- A 5% change in CDDs is worth about .5 Bcfd.
- Total demand could be 1 Bcfd higher or 1.5 Bcfd lower.

## Bcfd Equivalent Generation Non-Heating Season

Fuel	Ave.	05-04	% Ch
Coal	47.5	1.1	2.4%
Petroleum	2.8	0.0	0.0%
Natural Gas	16.8	1.0	5.8%
Nuclear	18.9	0.0	0.0%
Hydro (1)	10.6	0.5	4.7%
<b>Total</b>	<b>96.6</b>	<b>2.6</b>	<b>2.7%</b>

(1) Includes Geothermal and other

# With normal weather, working gas storage injections should be approximately 2025 Bcf during the non-heating season.

- Weather and oil prices are major uncertainties.
- Weather adjusted storage withdrawals indicate the supply-demand balance is looser than last year.
- Residential and commercial consumption declined .3 Bcfd last summer and production could be higher than estimated.
- Prices will adjust to assure storage is close to full.

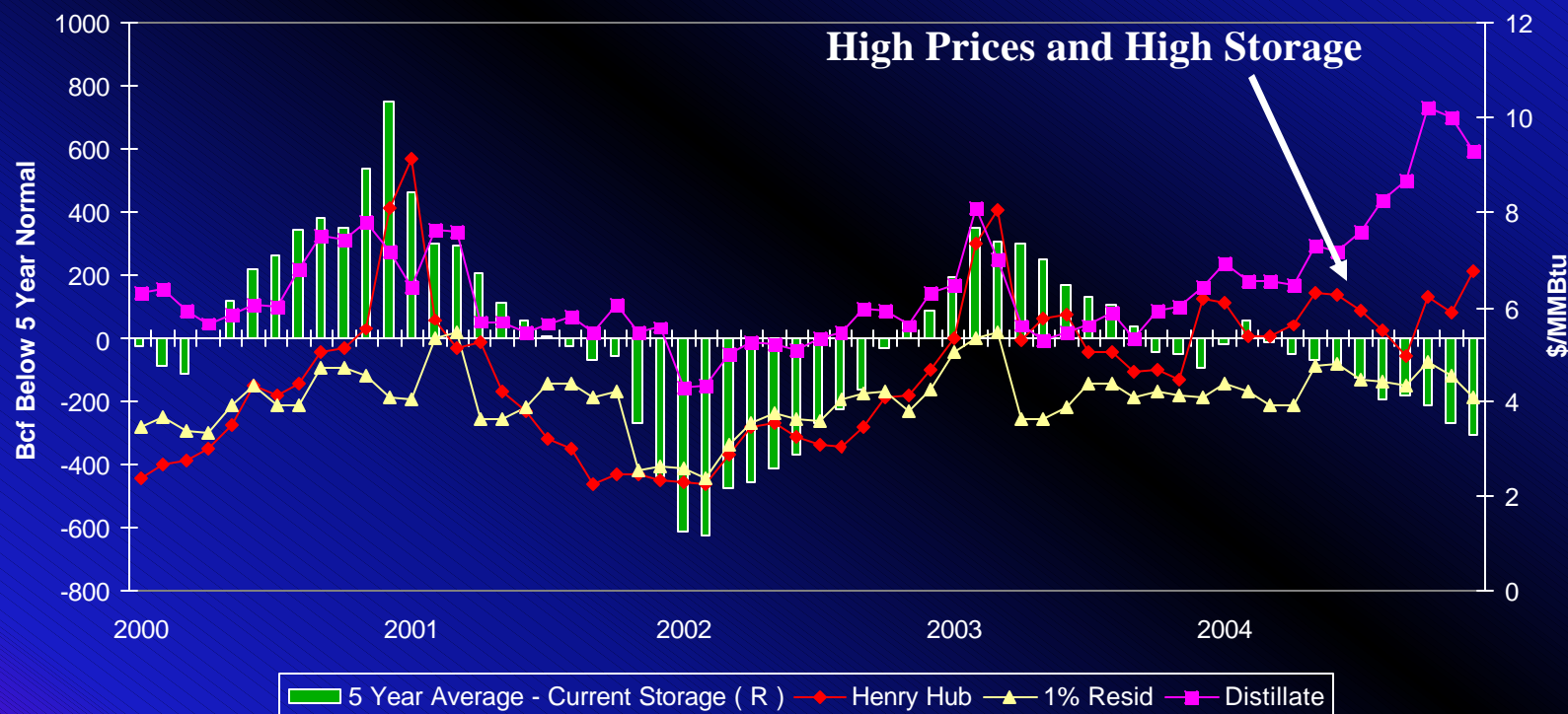
## Non-Heating Season Supply-Demand

Sector	2005	05-04 (Bcfd)	05-04 %Change
Residential	6.2	0.05	0.9%
Commercial	5.1	0.05	0.9%
Industrial	18.8	0.28	1.5%
Electric Power	16.8	1.10	7.0%
Other	4.5	-0.01	
<b>Total Deliveries</b>	<b>51.4</b>	<b>1.47</b>	<b>2.9%</b>
Production	51.3	0.14	0.3%
LNG	1.9	0.28	14.5%
Canada & Mexico	7.9	0.12	1.5%
<b>Total New Supply</b>	<b>61.1</b>	<b>0.54</b>	<b>0.9%</b>

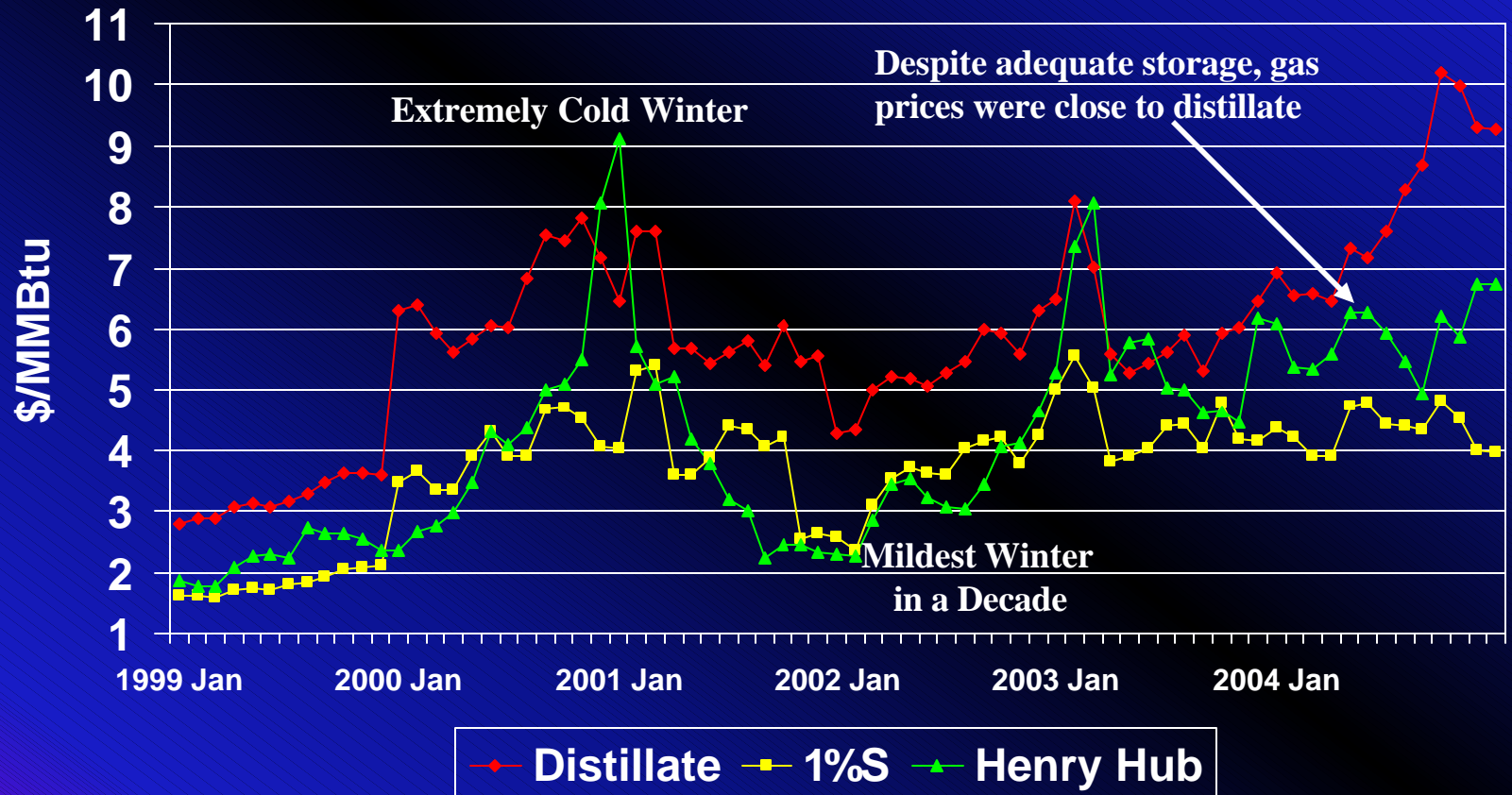


**Working gas storage indicates direction of prices but not level. Despite high storage levels, prices stayed high this year because of expectations of extreme weather, high oil prices, and curtailed production.**

## Henry Hub Prices vs Working Gas Storage



As long as the natural gas price is between distillate and residual fuel oil prices, gas price changes have little short term impact on the supply-demand balance. Consequently, expectations and speculation can cause sharp price movements.



**Lower oil prices and higher storage should cause prices to be below last year but there are many uncertainties.**

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- **Weather and hydro are major uncertainties**
- **Weather adjusted storage withdrawals suggests that the supply-demand balance may be looser than we are projecting.**
- **Despite indications of adequate supply, gas prices surged last spring based on high oil prices, forecasts of a hot summer, and speculation.**
- **Oil supply disruptions could provide upside**
- **Currency re-evaluation could hit Asian economy hard and put downward pressures on oil prices. US economic growth forecasts are being lowered because of trade deficit.**

**Call on OPEC is expected to be about the same as 2004. Currency devaluation has raised OPEC's implicit WTI target to between \$35 and \$40 per barrel.**

**2005 Oil Projections (mmbd)**

<b>Forecast</b>	<b>Demand (1)</b>	<b>Non-OPEC (2)</b>
<b>EIA</b>	<b>2.00</b>	<b>.9</b>
<b>IEA</b>	<b>1.4</b>	<b>1.2</b>
<b>OPEC</b>	<b>1.5</b>	<b>1.2</b>

**(1) 2004 demand growth was 2.6 mmbd. (2) non OPEC supply growth was 1.1 mmbd**