

# **North American Natural Gas: Plausible Prices and Their Impact**

*Southern Gas Association: Gas Forecasters  
Forum*

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# North American Natural Gas: Plausible Prices and Their Impact

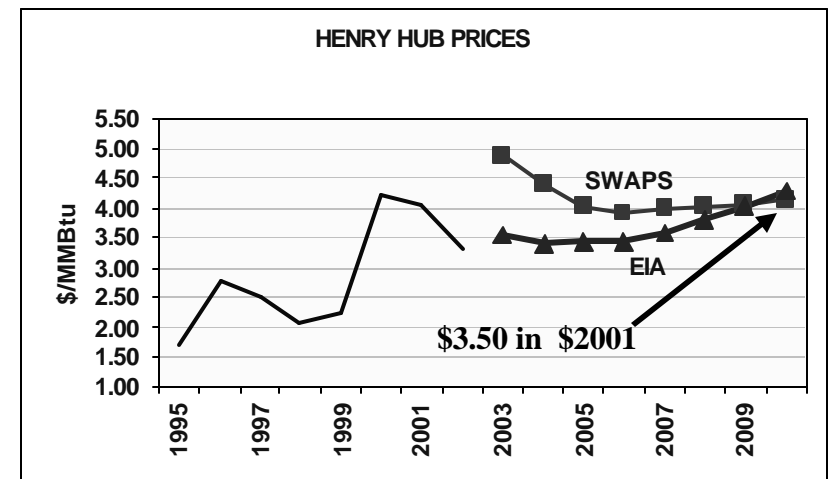
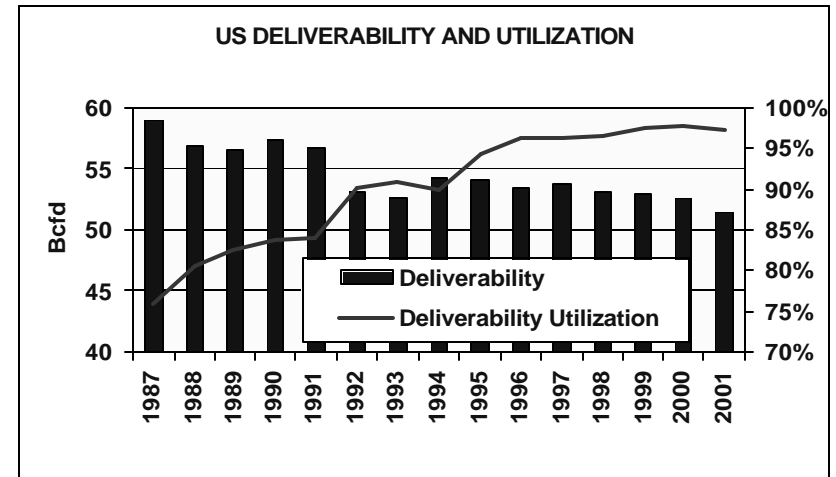
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- **Overview of market expectations**
- **Demand**
  - **Response to price**
  - **New Source Review**
  - **Industrial sector**
- **Supply**
- **Alternative transitions to LNG**

# “The Future Ain’t What It Use to Be”

## Yogi Berra

- **1973:** The Department of the Interior called the Gulf the “Dead Sea.”
- **1978:** Oil prices were forecasted to reach \$100 per barrel by 1990.
- **Coal** was going to be the solution to the world’s energy needs.
- **1996:** Forecasts predicted that growth in supplies from the Gulf and Canada would cause a gas bubble by 2000.
- **Now:** Henry Hub prices for 2010 are trading at \$4.50 to \$4.75 per MMBtu.



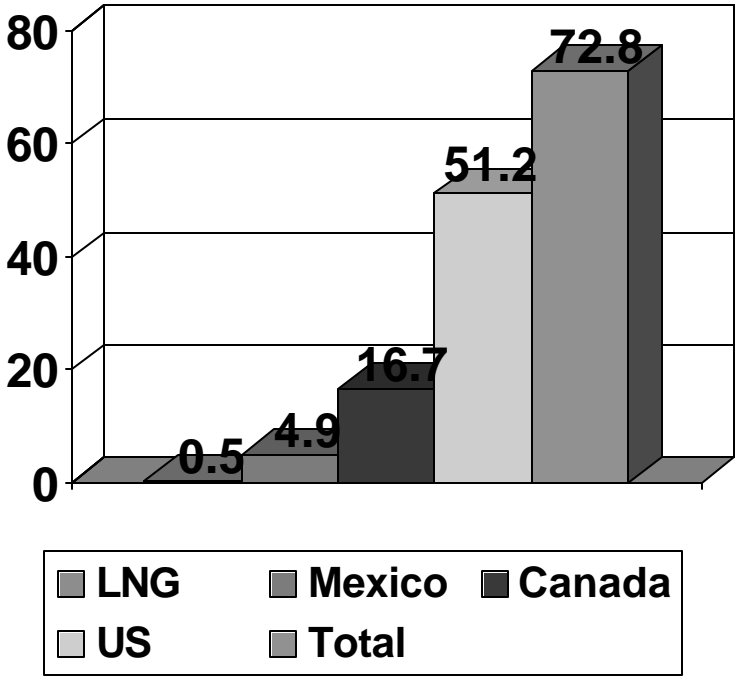
# **The current view of most analysts is for high prices and a difficult transition to a period when LNG will account for 10% to 15% of US supplies.**

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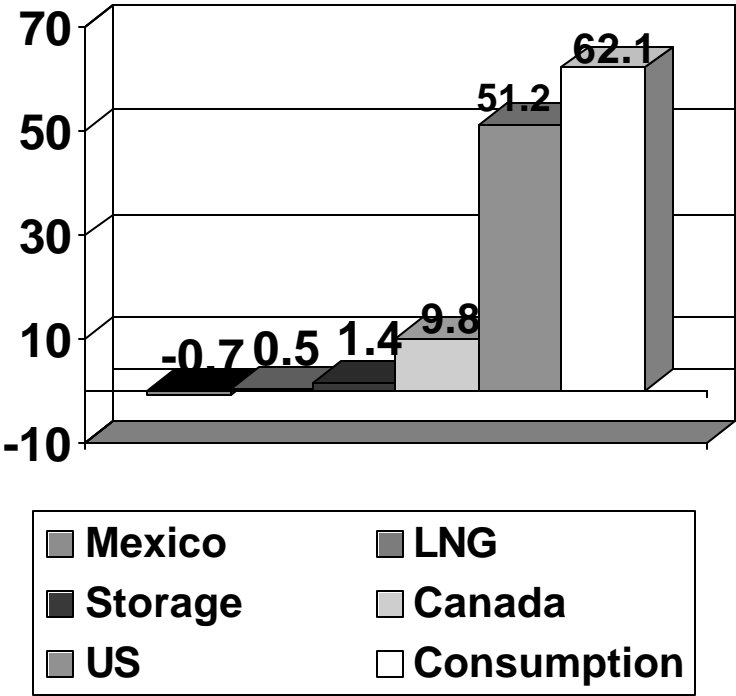
- **US production will be down 1% in 2003. US production is at the same level as five years ago.**
- **Canadian production will be down 2% to 4% in 2003 and probably flat in 2004 and 2005.**
- **Availability of ships, LNG terminal capacity, and liquefaction capability will limit increased LNG imports until 2007 or later.**
- **Gas consumption for power generation will cause gas demand to grow 1% to 2% per year.**
- **Henry Hub prices average between \$4.00 and \$6.00 per MMBtu through 2010.**
- **Alaskan supply will require \$4 to \$5 prices. (Developed in 2015)**
- **Most LNG supplies can be imported at less than \$3.50 per MMBtu.**
- **Conventional Alberta supplies have peaked (EUB).**
- **Mackenzie Delta gas will be needed for bitumen production and to offset the decline in Alberta.**

# 2002 North American Natural Gas Supply was 72.8 Bcfd and US Consumption was 62.1 Bcfd.

North American Natural Gas Supply (Bcfd)

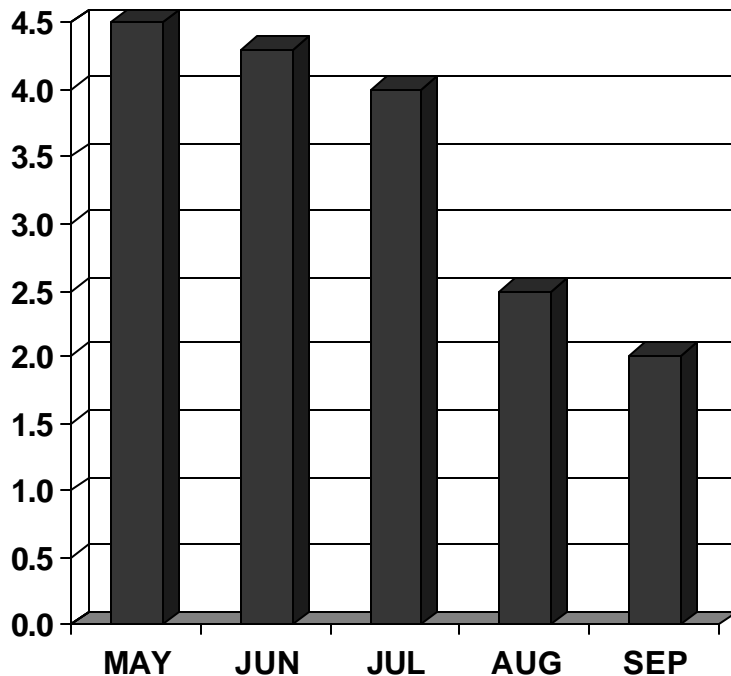


US Natural Gas Supply (Bcfd)

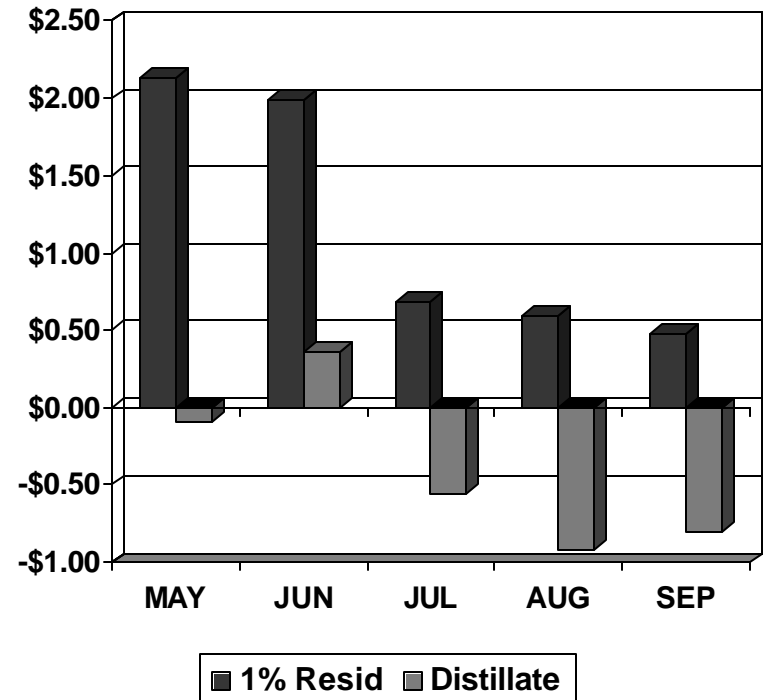


# Prices above distillate cause substantial losses in gas consumption. Even with lower gas prices, weather adjusted storage injections are running 2 Bcfd above last year.

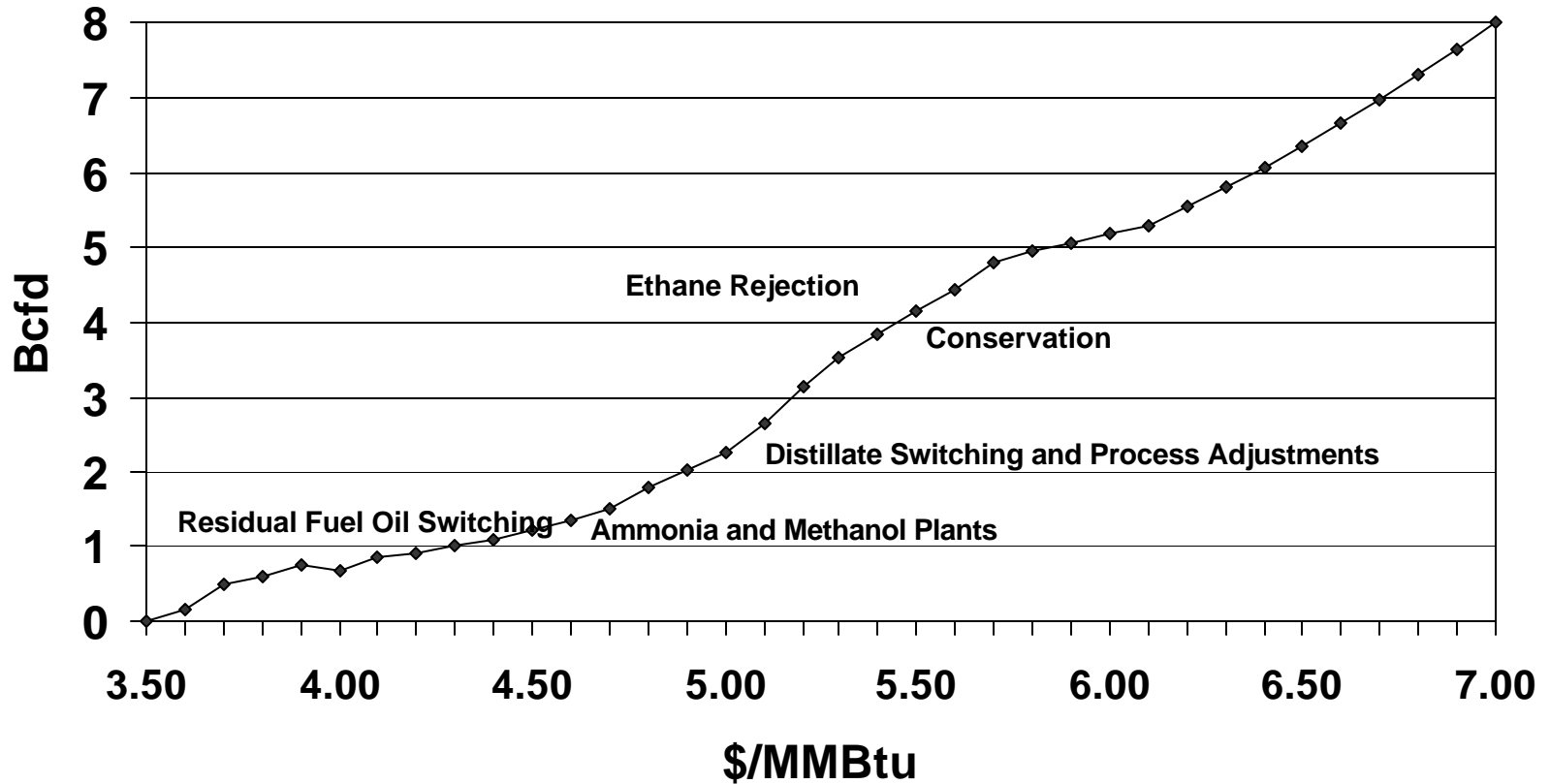
Weather Adjusted Storage Injections vs. 2002 (Bcf/day)



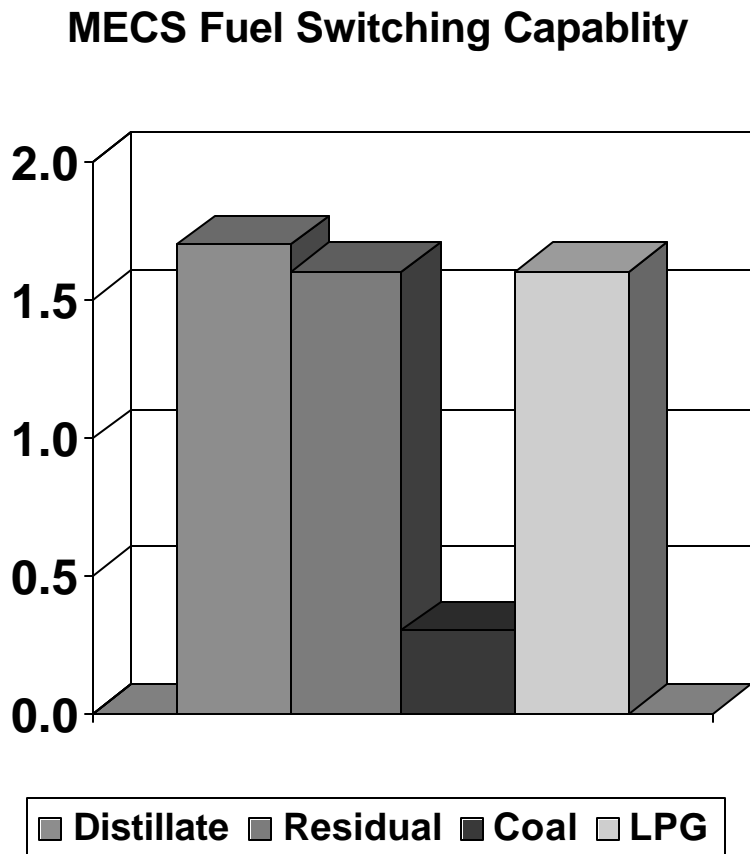
NY Gas Premium over Oil (\$/MMBtu)



# Demand Loss versus Henry Hub Price (WTI=25\$/barrel)



# The information on industrial fuel switching capability is very limited.

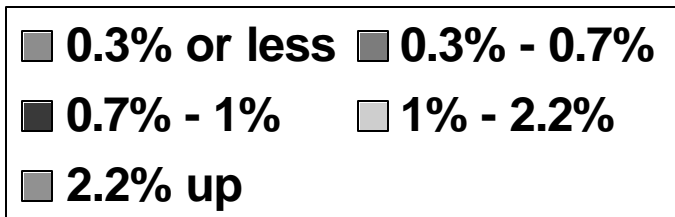
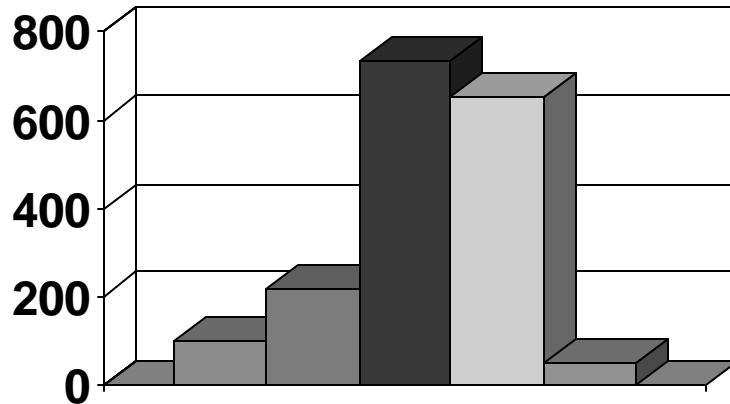


- The 1998 MECS study switching capability is much higher than actual switching.
- Annual residual fuel oil consumption in the industrial sector is only about .5 Bcf.
- A Department of Commerce study indicated about 500 Bcf per year of boiler switching capability during 1994-98.
- NPC study suggests boiler switching capability of approximately 200 Bcf per year or less.



**Electric power fuel switching is complex. It depends upon the season, dispatch, residual sulfur content, and location. Potential switching is 1 to 2 Bcfd.**

**Electric Power Residual Fuel Oil (MMcfd)**



**Northeast Fuel Switching Prices**

	\$/MMBtu	
	<u>SEP</u>	<u>JAN</u>
WTI = \$30/ bbl		
1% Resid NY	3.65	3.65
Taxes & Shipping	0.45	0.45
Delivered NY	4.10	4.10
Basis	0.30	1.00
Henry Hub (Steam)	3.80	<u>3.10</u>
Henry Hub (CC)	<u>5.32</u>	4.34

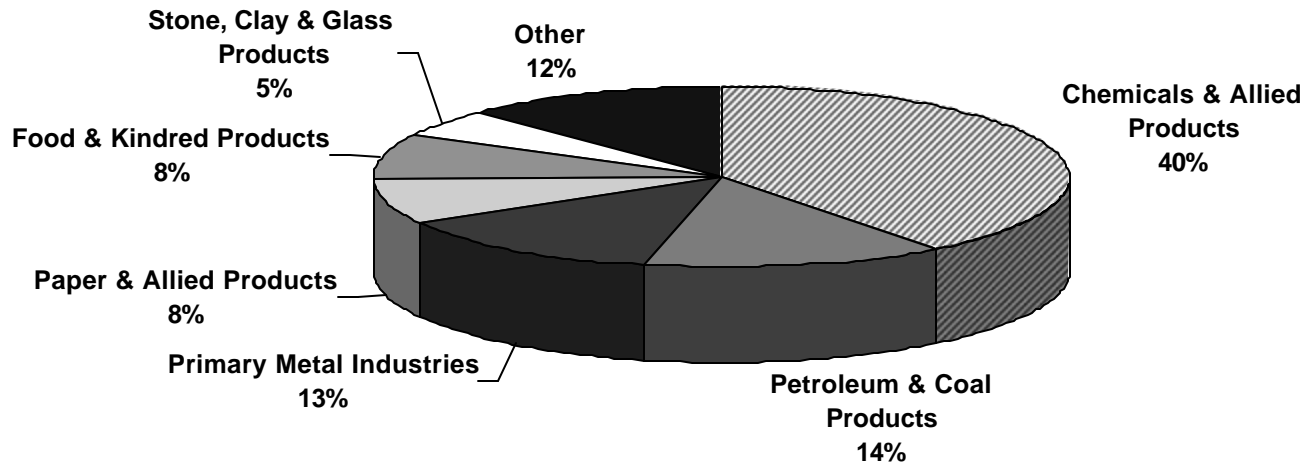
**August EPA ruling could cause the loss of 3.6 Bcfd of gas consumption (three years of gas consumption growth).**

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- **Ruling applies to grandfathered plants that were not required to install Best Available Control Technology - BACT (1977 Clean Air Act).**
- **The ruling would allow up to 20% of cost of the plant to be spent on maintenance and not be subject to New Source Review (NSR).**
- **Approximately 110 GW of coal fired plants could increase capacity by 15% to 25%. 70 GW could be expanded within one year. The interpretation of this ruling is controversial.**
- **The ruling is being challenged in the courts and the probability is high that it will be overturned.**
- **Still, some power plants are expanding capacity.**

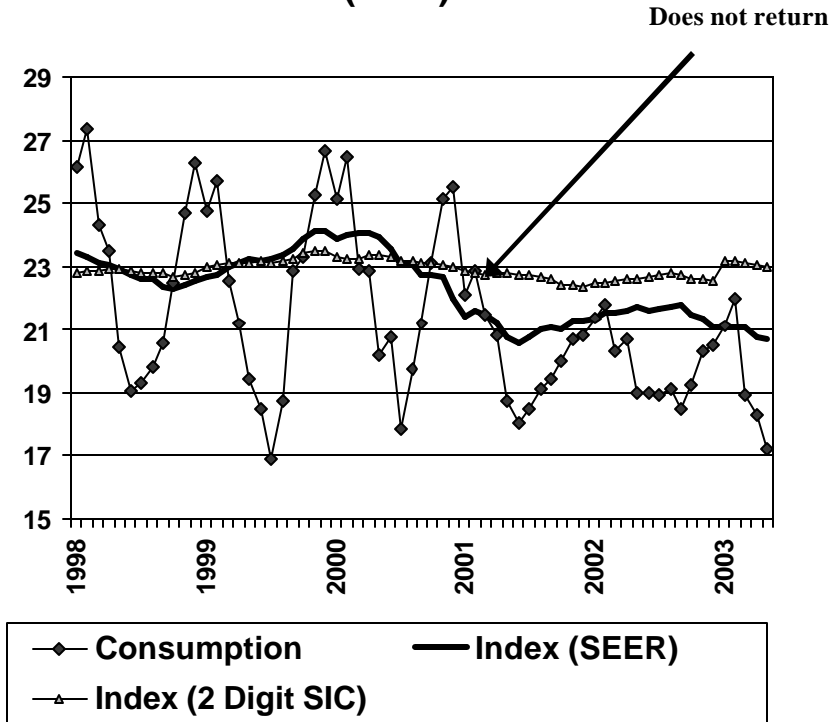
**Industrial gas consumption is about 20 Bcfd. It accounts for one-third of US consumption. Two-thirds of consumption is in the Chemicals, Petroleum and Primary Metals sectors.**

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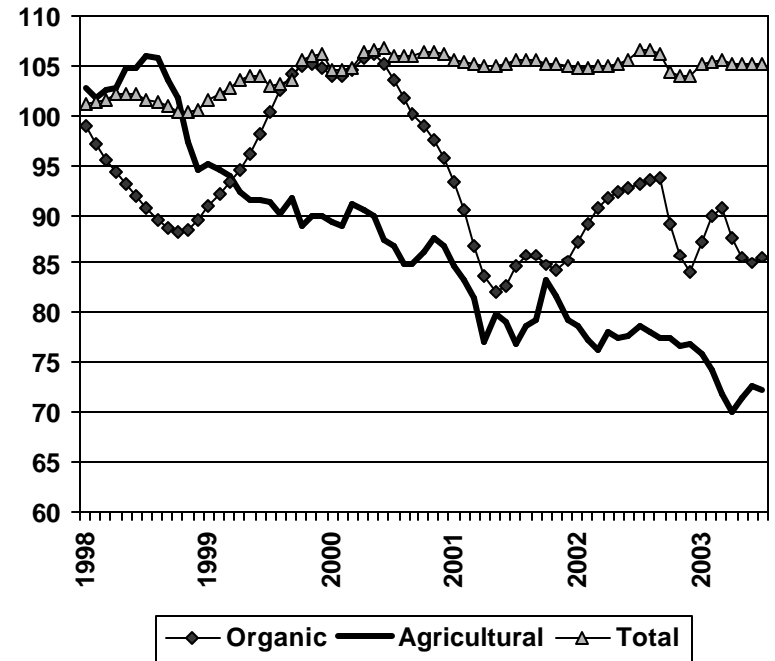


# Industrial gas consumption is not likely to grow and could continue declining.

**Industrial Production Indices versus Industrial Production (Bcf/d)**

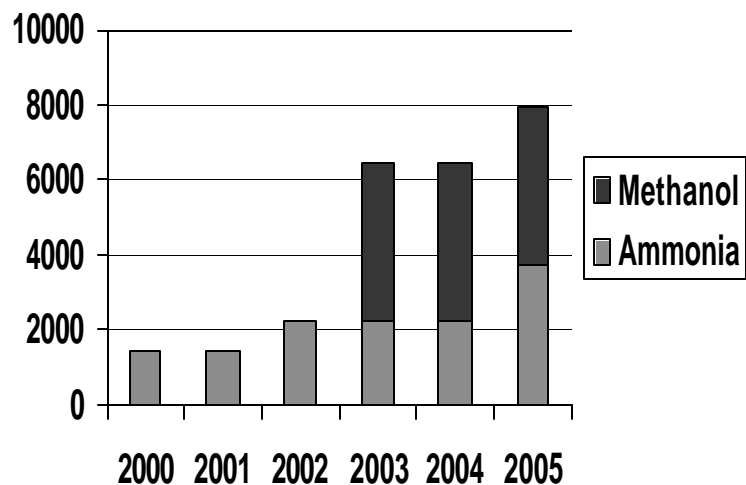


**Gas Intensive Chemical Production Indices vs. Total Chemicals**



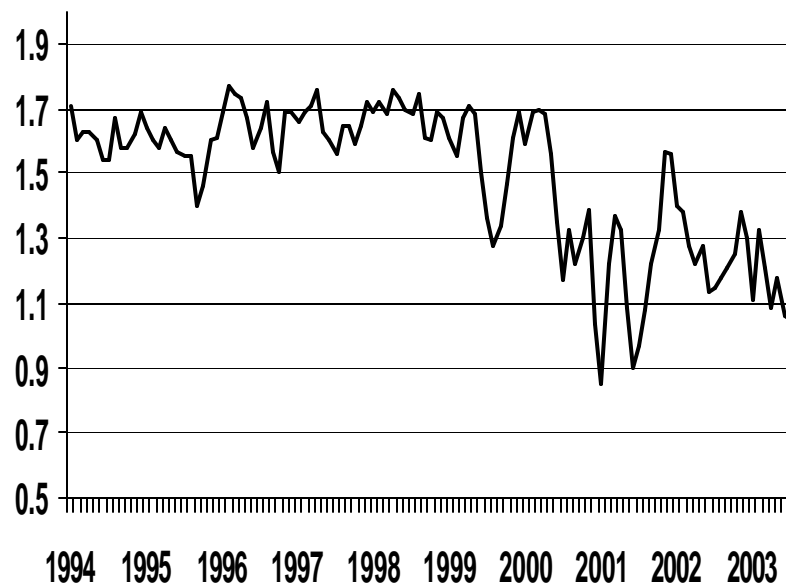
**Ammonia and Methanol Capacity in Trinidad and Venezuela is increasing. Proposed capacity amounts to about 1.2 Bcfd of gas consumption. (20% of US Ammonia capacity has permanently closed in past three years).**

**Million Metric Tons  
Cumulative**



One million metric tons is 150 MMcfd

**US Anhydrous Ammonia  
Production (Bcfd)**



**There is substantial disagreement about the outlook for production. Quarterly report data shows 1<sup>st</sup> quarter production was down 2% from last year. EIA shows production up 3.2%.**

- Quarterly report data is biased – large producers overstate production decline. Some believe the quarterly report data is wrong.
- Last year EIA revised initial production estimates down 2%.
- OCS is the big question. Substantial deepwater came on the 1<sup>st</sup> quarter. However, the first quarter data are estimates and the rig count has not changed from 2002.
- Texas was up 3% in June, Rockies up close to 1 Bcfd (15%). New Mexico is growing.

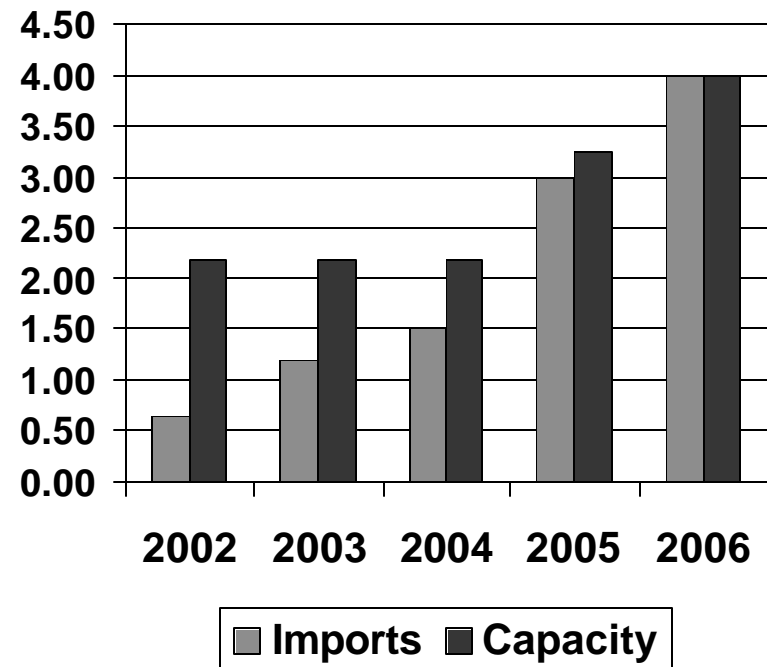
**1<sup>st</sup> Quarter Production (Bcfd)**

AREA	2003		%CH 03	
	<u>2002</u>	<u>2003</u>	<u>-2002</u>	<u>02</u>
NM	4.17	4.40	0.23	5.4%
LA	3.69	3.59	-0.10	-2.7%
OCS	12.59	12.93	0.34	2.7%
TX	15.85	15.48	-0.38	-2.4%
SUBTOTAL	36.31	36.40	-0.39	0.3%
<hr/>				
	EIA			
ROCKIES	6.61	7.19	0.58	8.8%
OK	4.40	4.56	0.16	3.6%
SUBTOTAL	11.01	11.75	0.74	6.7%
TOTAL	47.32	48.15	0.34	1.8%

# Until 2008 or later, liquefaction capacity is likely to be the greatest constraint on increased LNG imports.

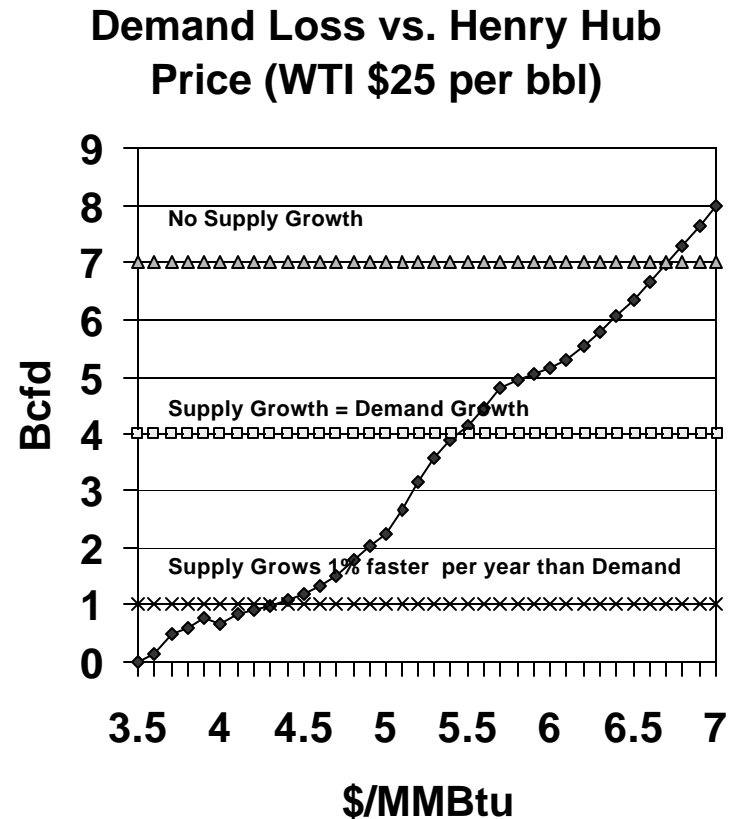
- If demand grows about 1.5% per year, supply will have to increase by 1.0 Bcfd per year.
- Existing terminals could add approximately 1 Bcfd of supply during each the next three years.
- LNG supply would have to be diverted from Europe or Asia. Spain is over-contracted but prices will have to be high enough to attract supply.

Potential LNG Imports  
(Bcfd)



# Alternative assumptions result in Henry Hub prices ranging from \$3.50 per MMBtu to \$7.00 per MMBtu.

- Assuming 1% per year demand growth through 2008, Henry Hub prices could range from \$4.30 per MMBtu to \$7.00 per MMBtu with normal weather.
- Every \$/bbl change in WTI is equal to about \$.17 cents per MMBtu change in Henry Hub prices.
- NSR path could drive prices down to \$3.50 per MMBtu.





**New long term supply sources will be available at \$3.50 (\$2002) per MMBtu or less but the decline in conventional supplies could require much higher prices. The demand response to price will be a key driver.**

- **Mackenzie Delta at less than \$3.00 per MMBtu.**
- **LNG from marginal sources such as Qatar less than \$3.50 per MMBtu**
- **Alaska 4-6 Bcfd, \$3.50 (\$2002) per MMBtu (developed about 2015).**
- **Coal is economic at \$4.00 - \$4.50 delivered gas.**
- **Has the most price sensitive part of demand already been lost?**

### National Petroleum Council (Scenarios)

