Natural Gas Price: Riding the Roller Coaster

NEMS/AEO Outlook Conference

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Overview

- Fundamental drivers of the gas market.
- Recent history.
- Near-term outlook.
- Conclusions

Gas Pricing Fundamentals

- Gas prices are determined by the balance of supply and demand in a regional marketplace.
- In the short-run, gas supply is determined by:
  - Deliverability (or the total productive capacity).
  - Opportunity to sell gas in another market including the cost and availability of transportation.

Gas Supply: Long run vs. Short run

- Long run
  - Number of wells needed to meet demand.
  - "All in" cost of wells.
- Short-run
  - Maximum production capacity (deliverability).
  - A decision to reduce production ("shut-in") because of market price.

Natural Gas Productive Capacity

- A low price environment (1990 - 1999) focus producers to most economic gas fields
- Technology accelerates production of gas reserves
  - provides improved project economics
- Producers adopt “just in time” management of productive capacity
  - requires a continuing stream of new gas well completions to replace more rapid depletion of existing productive capacity

Determinants of Gas Demand

- Gas demand is driven by:
  - Weather
  - Electricity demand
  - ***Economic growth***
- Economics of the marginal customer's next best alternative:
  - Ability to switch to alternate fuel, generally oil.
  - Power plant dispatch options.
  - Industrials "shut-down" when variable costs exceed product prices.

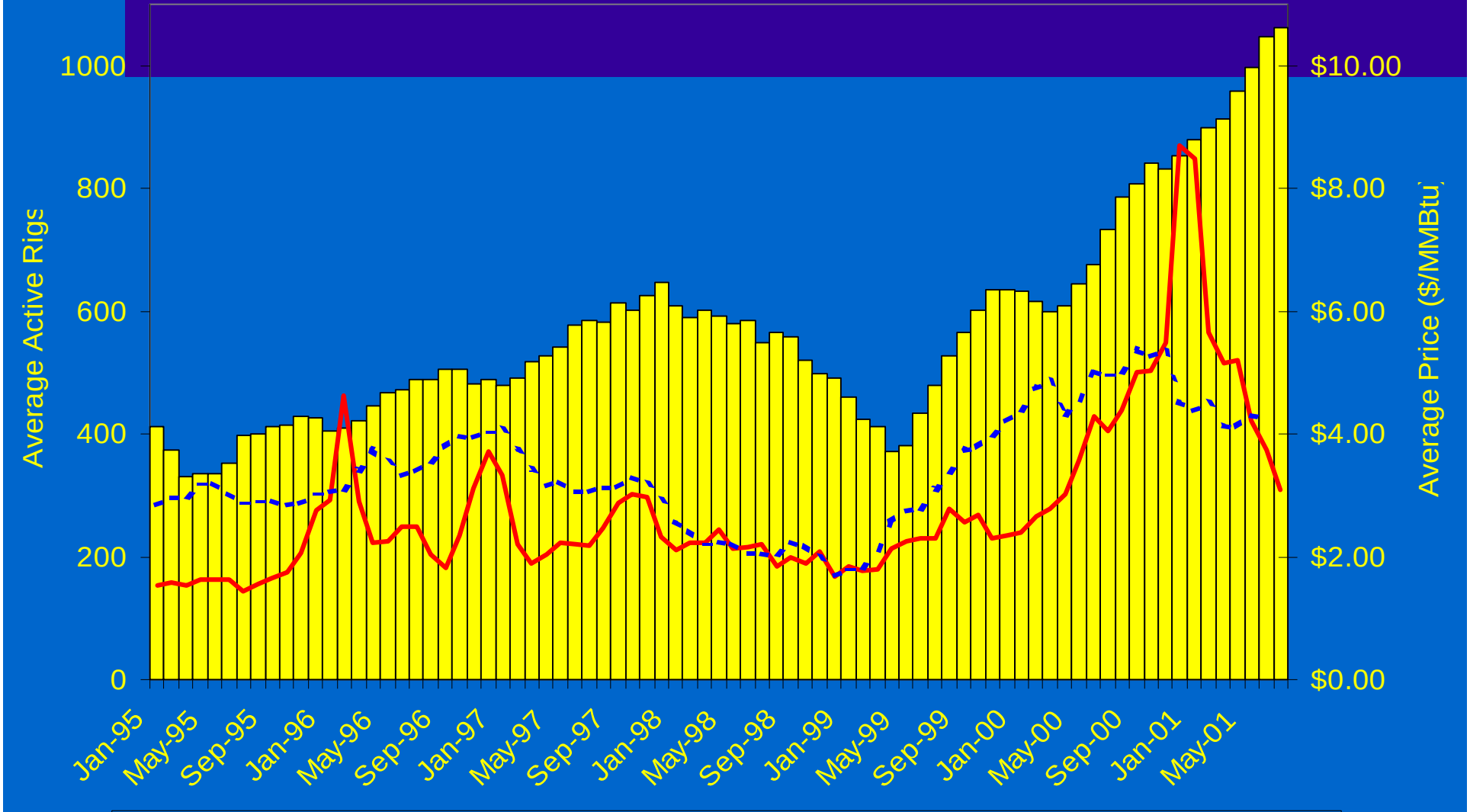
The Delicate Balance

- So long as drilling activity is sufficient to replace productive capacity and supply incremental requirements, prices remain stable
- But if events conspire to disrupt the balance… ***Watch Out***

The Year 2000 Disruption

- Warm weather lulls the market
  - no seasonal peak in gas prices in 1998-99 and 1999-00 winters masked the needed price signals
- Low oil prices from Jan.1998 through March 1999 put producers in a cash flow crunch that limited drilling
- High oil prices in 1999 and early 2000 keep dual fuel customers “on gas”at higher gas prices
- Cold weather returned!

Gas Directed Drilling Activity and Crude Oil and Gas Prices



Changing Demand Conditions

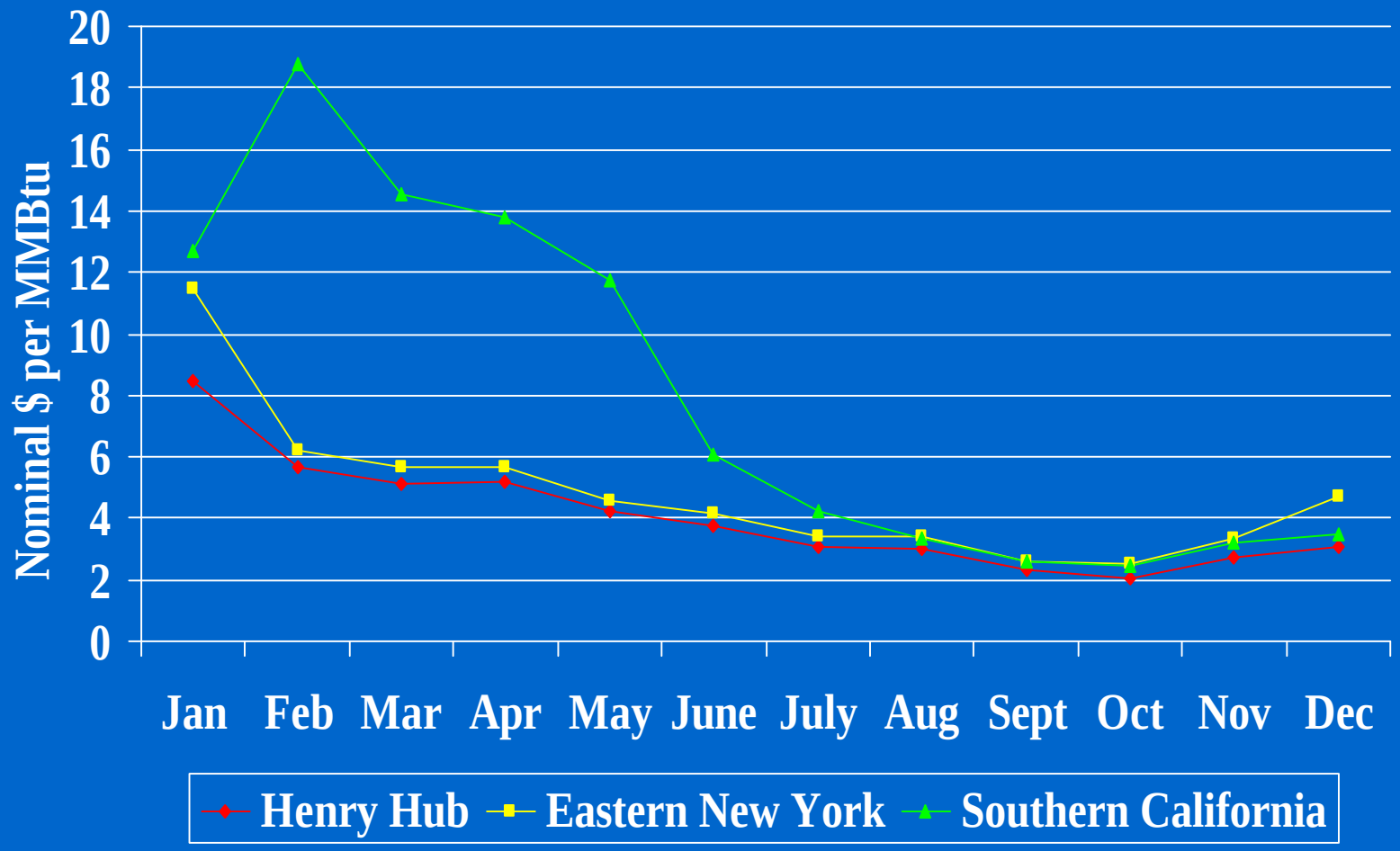
- Warm winter weather.
- Recession and industrial production declines.
- Price response.

Yearly Change in Gas Demand (Bcfd)

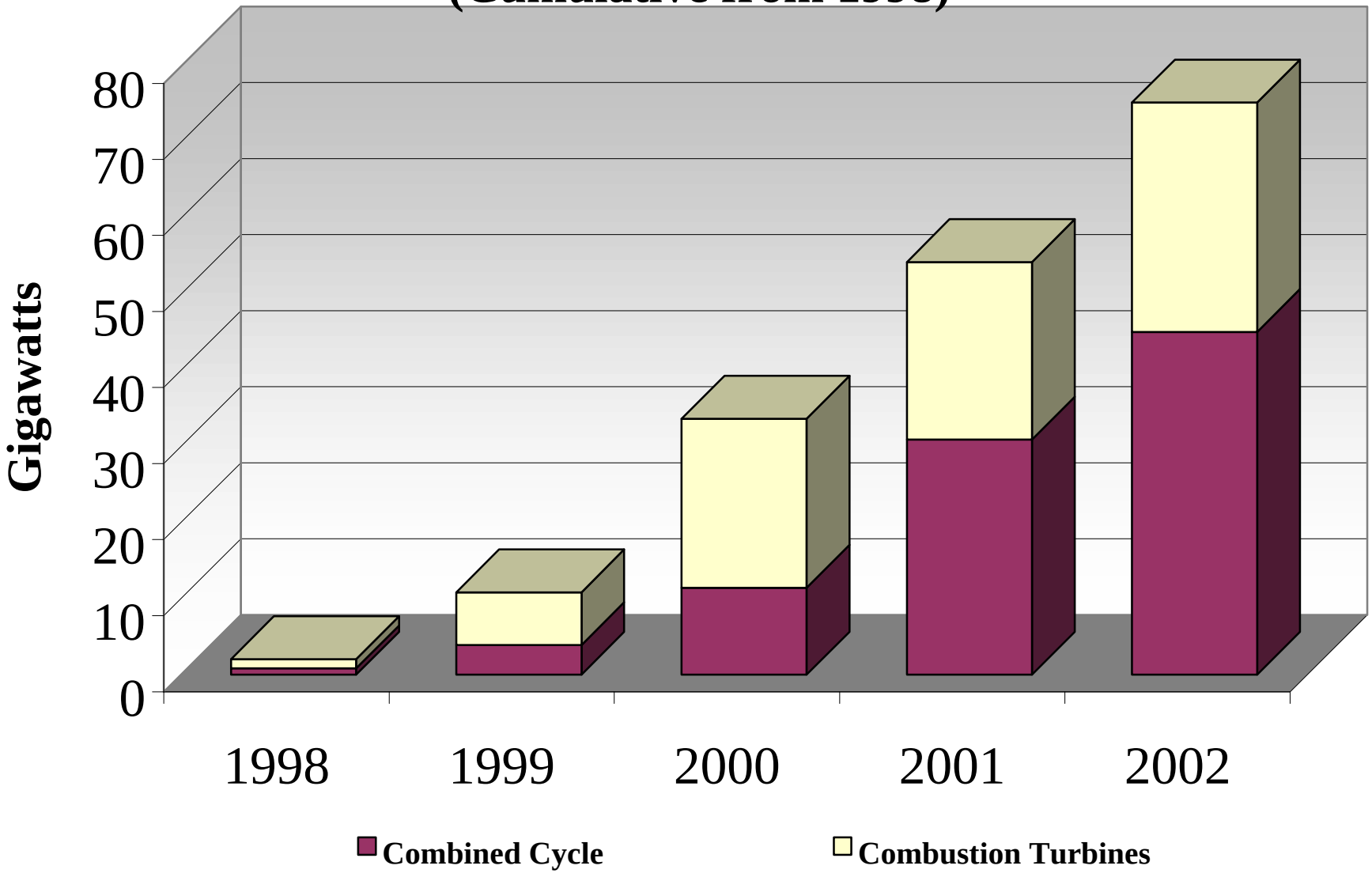
	2000	2001	Change	% Change
Residential	13.9	13.9	0.0	-0.3%
Commercial	9.1	8.9	-0.1	-1.6%
Industrial	24.0	22.2	-1.8	-7.6%
PowerGen	11.2	11.3	0.1	1.3%
Pipeline	2.1	2.1	0.0	-1.4%
Lease & Plant	3.4	3.5	0.1	3.6%
Total	63.7	61.9	-1.8	-2.8%
Electricity Sales (Bkwh)	3,364	3,388	23	0.7%
Storage Injections (Bcfd)/1	7.2	11.5	4.4	61.3%
Working Gas Levels (Tcf)/2	2.7	3.2	0.5	18.7%

1. Daily average for injection season in Bcfd.
2. Working gas levels as of October 31st.

2001 Natural Gas Prices



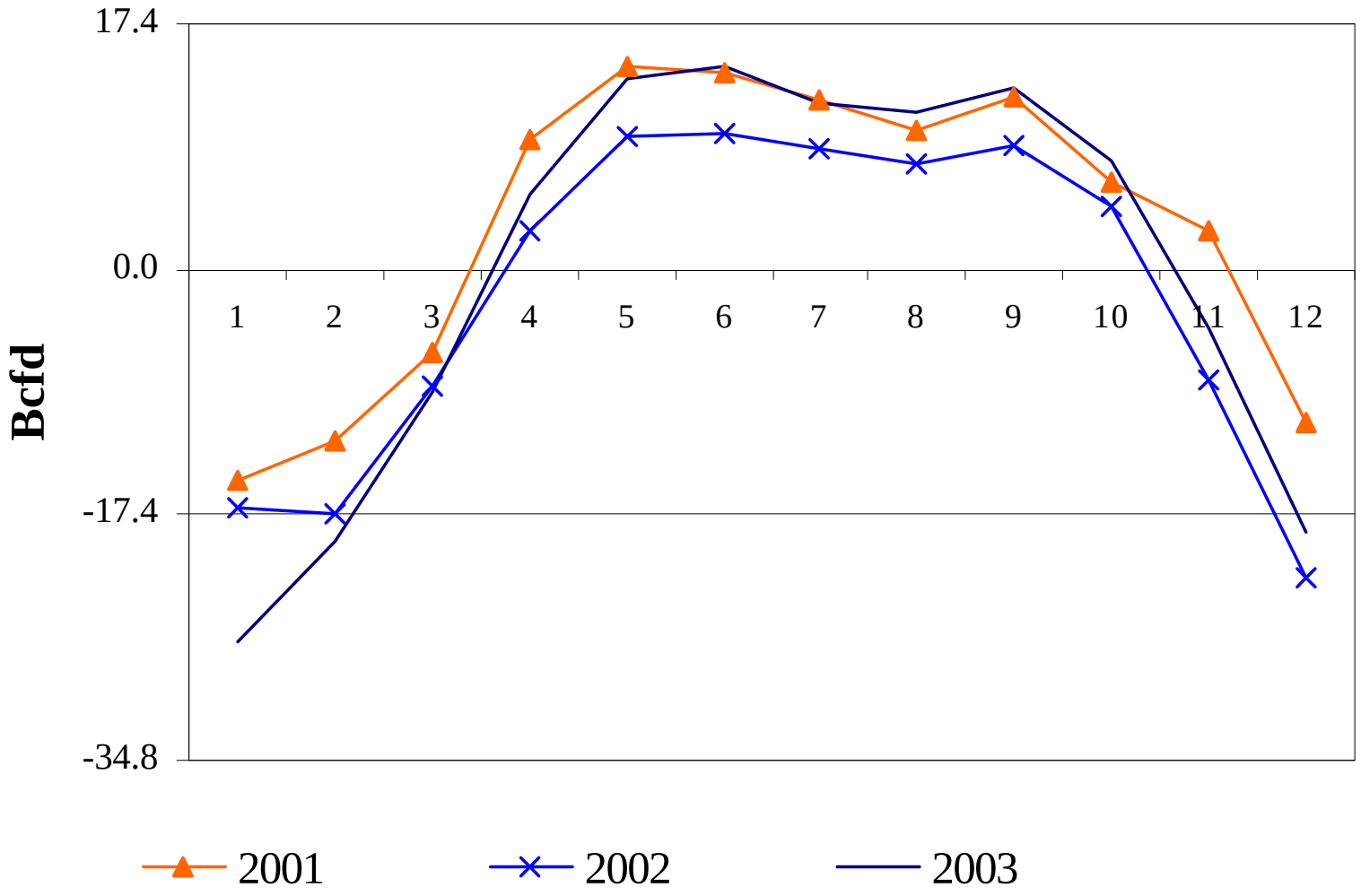
Gas-Fired Capacity Additions
(Cumulative from 1998)



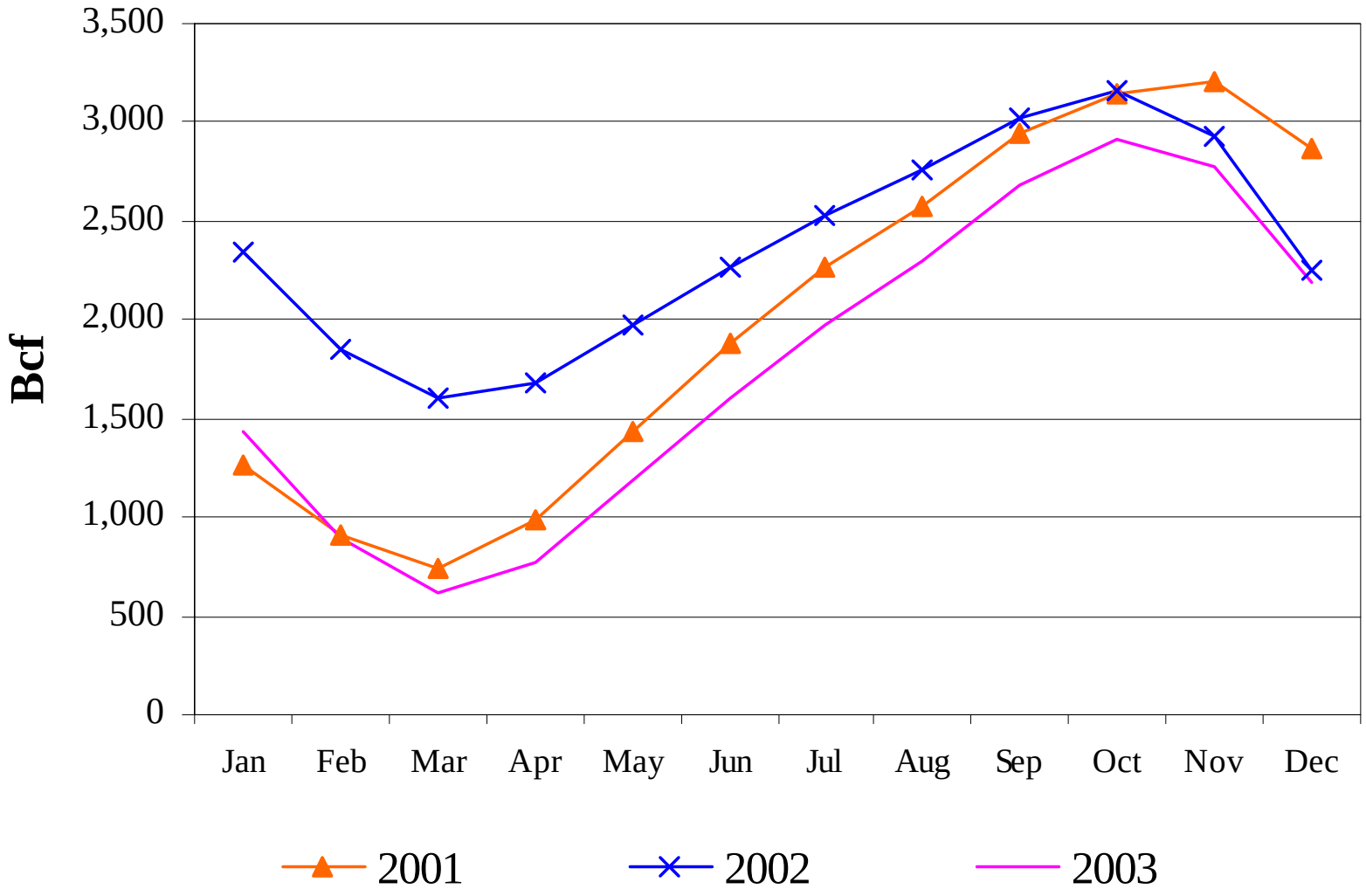
U.S. Injection Season Gas Balance (Bcfd)

	2001 Season	2002 Season	Change
Total Gas Supply	**63.4**	**63.5**	**0.1**
U.S. Dry Gas Production	53.5	53.9	0.5
Net Imports	9.7	9.4	-0.3
Net Storage withdrawals	0.0	0.0	0.0
Supplemental Gas	0.2	0.2	0.0
Ethane Rejection /1	0.0	0.0	0.0
Total Gas Demand	**62.2**	**62.3**	**0.0**
Residental Sector	6.4	6.7	0.3
Commercial Sector	5.3	5.5	0.2
Industrial Sector	20.9	21.6	0.7
Power Generation	13.2	15.7	2.5
Lease and Plant Gas	3.5	3.5	0.0
Pipeline Fuel	2.0	2.0	0.1
Net Storage Injections	11.1	7.3	-3.8
Imbalance (S-D)	**1.1**	**1.2**	**0.1**

U.S. Net Injections/Withdrawals

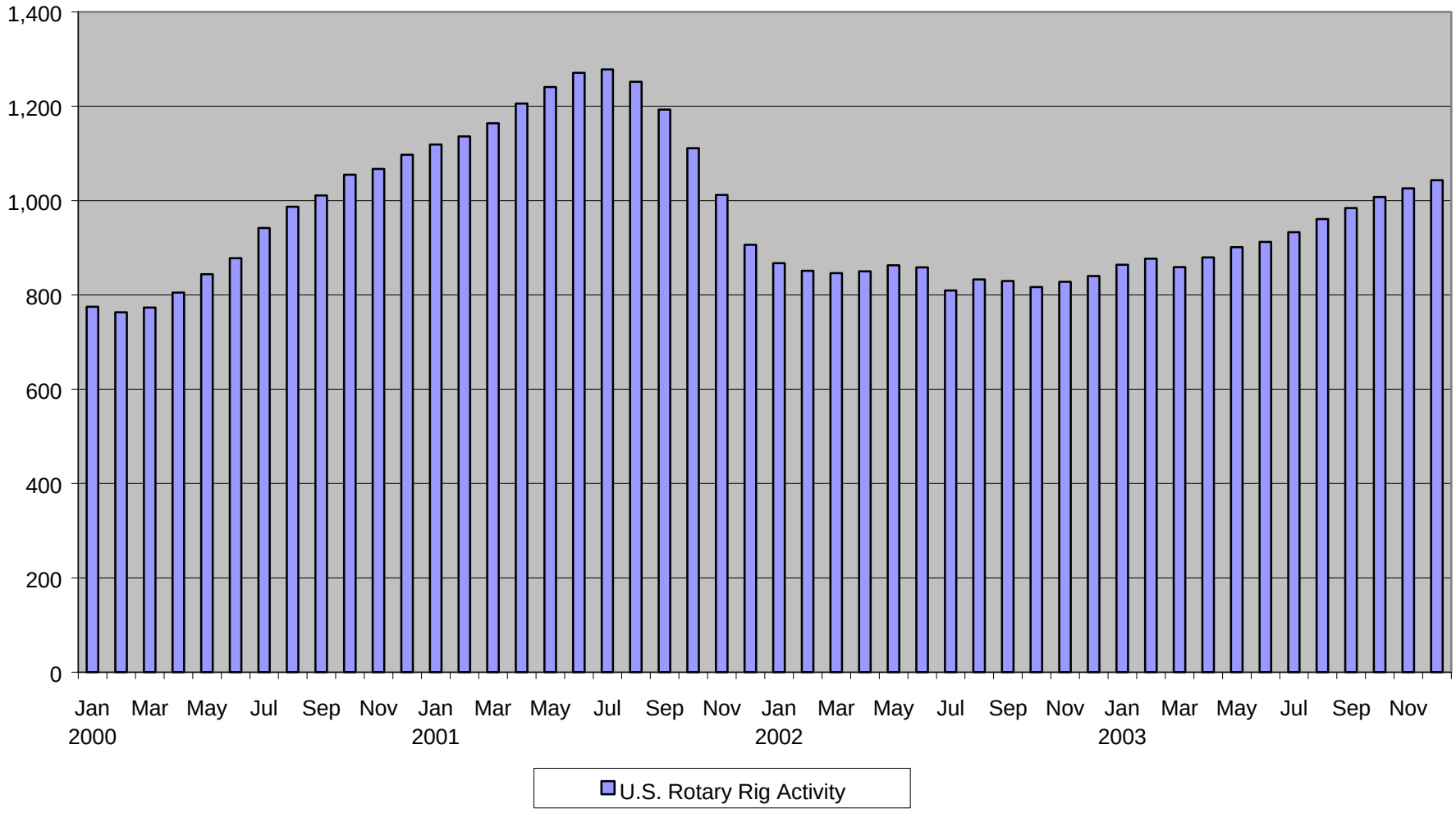


U.S. Working Gas

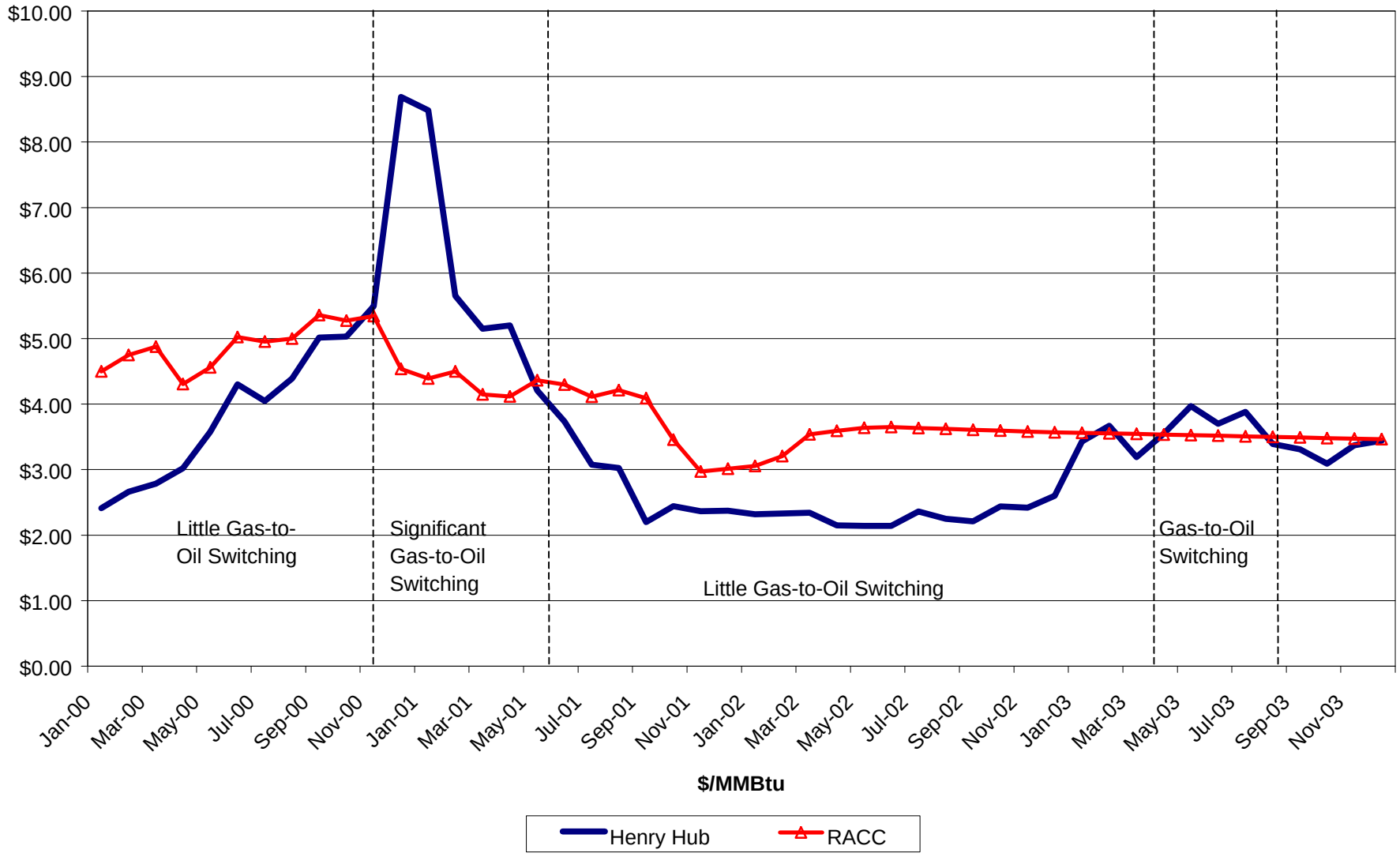


Gas Price at Henry Hub ($/MMBtu)

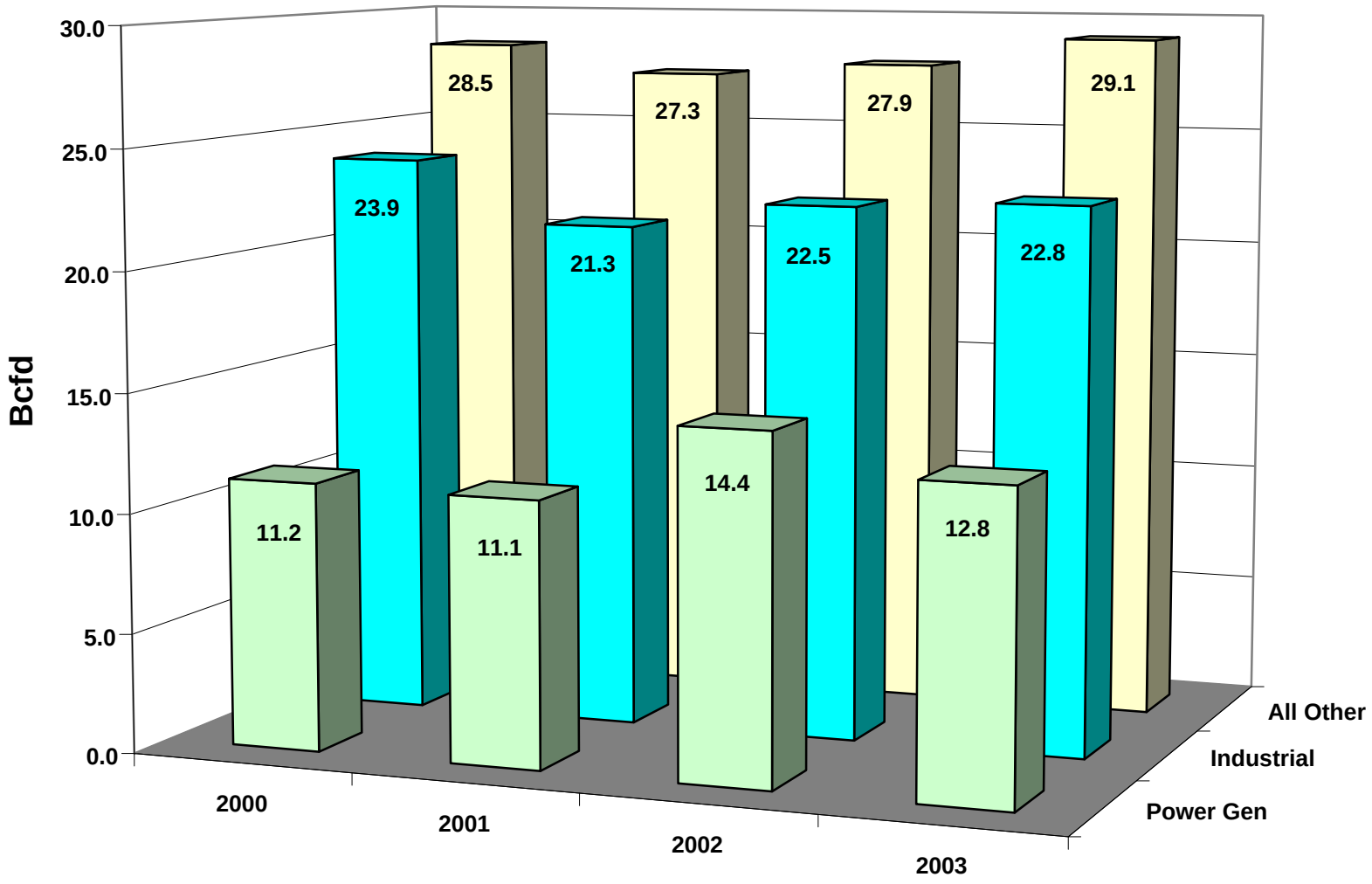
U.S. Rotary Rig Activity
2000 through 2003



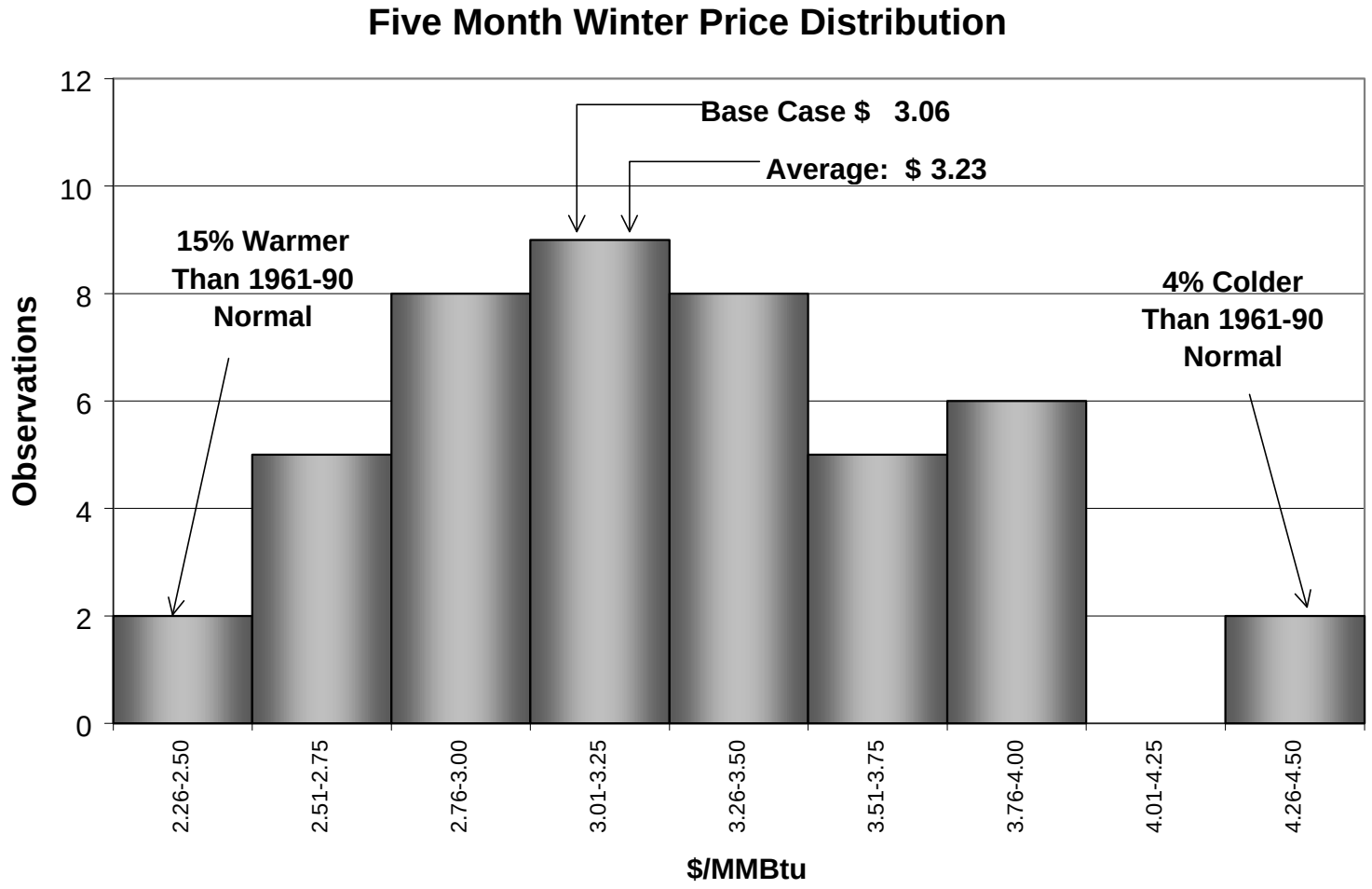
Henry Hub Prices vs. RACC



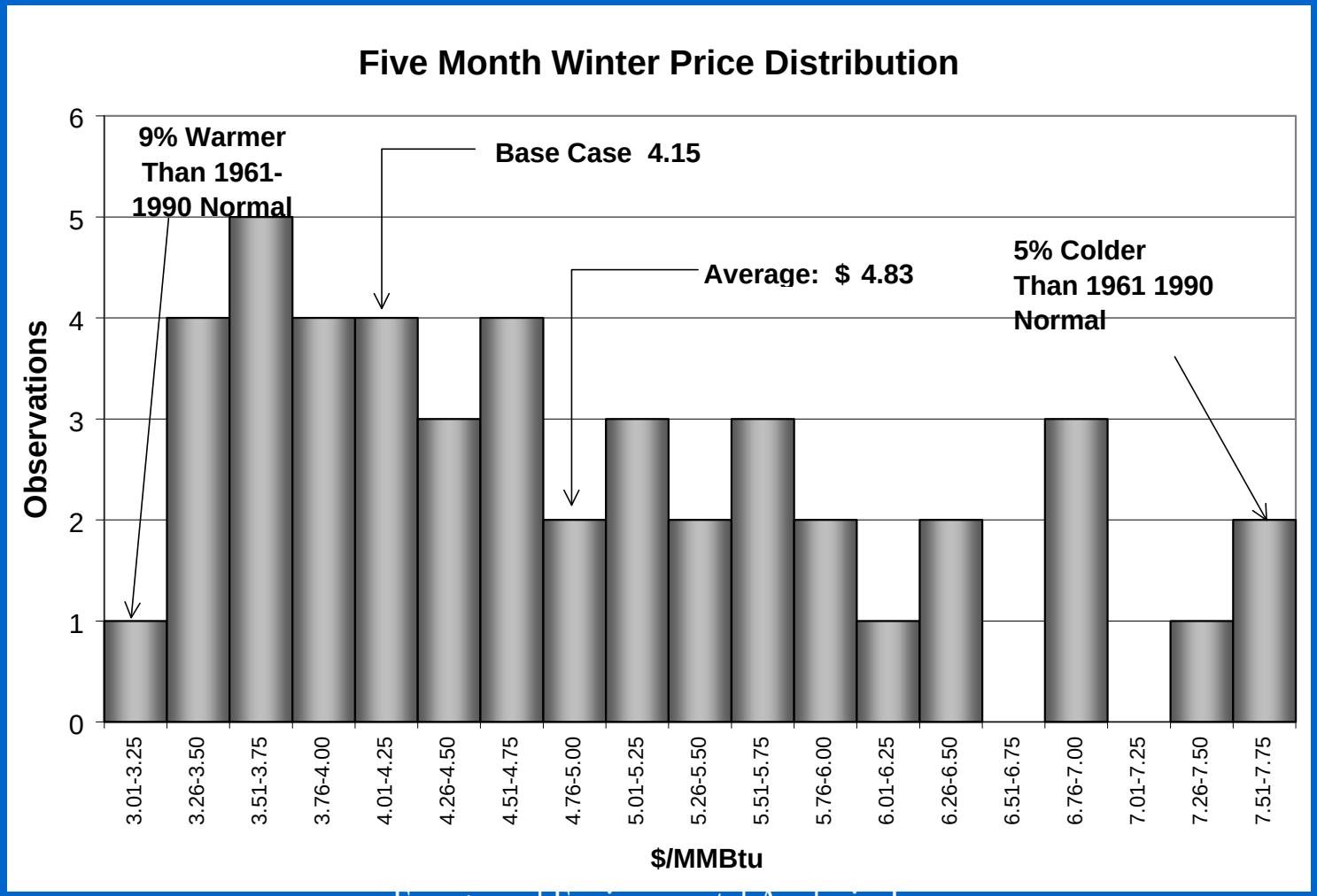
Natural Gas Demand



Henry Hub Price Distribution



New York City Price Distribution



Conclusions

- Natural gas deliverability grew as a result of drilling in 2000 and 2001.
  - About 1 Bcfd year over year.
- Reduced storage injections will create slack assuming normal weather.
- New gas-fired power plants soak-up much of the slack.
- When storage injections return to normal in 2003, gas prices will need to be high enough to induce fuel switching.

Will the roller coaster ride continue?

Volatility and price swings look like a good bet!

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