

EVERYTHING YOU WANT TO KNOW ABOUT NATURAL GAS PRICES, AND MORE

*The National Regulatory Research
Institute*

October 27, 2004, 2:30-4:00 (EDT)



Purpose of Teleconference

- Primarily, review recent developments in the natural gas sector to assess where natural gas prices are heading for the next several months
- Secondarily, look at longer-term developments through the end of this decade
- The audience will be state PUC personnel

Organization of Dialogue

- NRRI will provide (1) a summary of recent developments in the natural gas sector, and (2) natural gas price forecasts taken from different studies
- Commissioner Robert Keating of Massachusetts will moderate the discussion
- Follow-up discussion by Commissioner Don Mason of the Ohio Public Utilities Commission, and David Maul of the California Energy Commission
- Questions and comments from call-in participants
- 1.5 hours in length

Participants

Moderator: Commissioner Robert Keating

Mr. Keating is a Commissioner of the Massachusetts Department of Telecommunications and Energy. He is currently Chairman of the Board of Directors for the National Regulatory Research Institute (NRRI). He is also a member of the National Petroleum Council, appointed by the Secretary of Energy.

Participants -- continued

Presenter: Mr. Ken Costello, NRRI

Mr. Costello is a Senior Institute Economist at NRRI. He has conducted extensive research and written widely on topics related to the energy industries and public utility regulation. His research has appeared in books, technical reports and monographs, and scholarly and trade publications.

Participants -- continued

Discussant: Commissioner Don Mason

Mr. Mason is Commissioner of the Public Utilities Commission of Ohio. He was appointed by U.S. Secretary of Energy Spencer Abraham to serve on the National Petroleum Council. He serves on the State of Ohio Security Task Force and was the coordinator of Ohio utility Y2K reliability efforts. Mr. Mason is chairman of the National Association of Regulatory Utility Commissioners (NARUC) Gas Committee and serves on the NARUC Ad Hoc Committee on Electric Restructuring and the Ad Hoc Committee on Critical Infrastructure.

Participants -- continued

Discussant: Mr. David Maul

David Maul is currently Manager of the Natural Gas and Special Projects Office at the California Energy Commission. In his current position, he directs the State of California's staff and their work to develop independent natural gas forecasts and energy policies dealing with natural gas demand, supply, infrastructure, and markets.

Outline of Costello's Presentation

- Highlights of recent market developments in natural gas
- Implications for State Commissions
- Background statistics and other information used in support of discussion

Summary of Major Market Developments (Costello)

- Natural gas prices are the highest they have ever been at this time of year
- Natural gas prices are projected to be considerably higher this upcoming winter than last winter
- Natural gas prices can easily soar above the \$10-11 range this winter with the combination of cold weather and high oil prices
- At the other extreme, a warm winter, plus falling oil prices, could drive natural gas prices this winter considerably below currently projected levels – perhaps, as low as \$5-6

Summary of Major Market Developments -- continued

- Over the past few years, natural gas prices have fluctuated widely and have exhibited an upward movement because of tight market conditions
- The consensus among experts is that natural gas prices will remain high and vulnerable to volatility, at least over the next few years, because of tight and fragile market conditions

Summary of Major Market Developments -- continued

- Experts disagree on longer-term natural gas prices – specifically, over when and how much prices will start to decline this decade from the levels of the past few years
- Liquefied natural gas (LNG) and gas supplies from other sources won't have a noticeable moderating effect on natural gas prices until at least the middle or later part of this decade

Summary of Major Market Developments -- continued

- Prices won't loosen until new gas sources are forthcoming, which may not occur until as late as 2008
- The past few years have seen intensive drilling activity, and upward movement in well completions
- But the productivity of gas wells continues to fall off and declines are expected in the future

Summary of Major Market Developments -- continued

- Natural gas prices in the short term are extremely sensitive to various factors, making price projections highly vulnerable to error
 - Storage levels
 - Weather
 - Gas production
 - Oil prices
 - General economic conditions
 - Regional pipeline capacity
 - Fuel switching

Summary of Major Market Developments -- continued

- In the short term, the outlook for the gas market is anything but settling and, certainly, not optimistic
- Current conditions in the gas market are in some ways analogous to those that emerged in the oil market during the 1970s

Implications of Price Forecasts for State Commission Actions

- Commissions should continue to be proactive in addressing the “high gas price” problem in their states
- It is important for commissions and gas utilities to promote energy efficiency in reducing customers’ gas bills
- Other options available to commissions and gas utilities identified in last year’s NARUC NGTF’s *Natural Gas Information “Toolkit”* (available on the NARUC website) will continue to be relevant for commissions to consider

Implications of Price Forecasts for State Commission Actions -- continued

- Commissions should stress the importance of hedging and gas utilities procuring a diversified gas portfolio
- Customers should be kept informed of developments in gas markets, especially as they relate to price
- Increased assistance to low-income households is critical as higher gas prices this winter will jeopardize these households' ability to purchase other goods and services

Background Statistics and Other Information

Sources of Data and Analysis

- EIA's *Short-Term Energy Outlook, Winter Fuels Outlook, Weekly Natural Gas Storage Report, AEO2004* (www.eia.doe.gov)
- *Gas Intelligence* (www.intelligencepress.com)
- NYMEX futures (www.nymex.com)
- Natural Gas Supply Association (NGSA, www.ngsa.org)
- AGA reports (www.aga.org)

Sources of Data and Analysis

-- *continued*

- Independent analysts
- National Petroleum Council (NPC, www.npc.org)
- Cambridge Energy Research Associates (CERA, www.cera.com)
- Strategic Energy and Economic Research (SEER, www.energyseer.com)
- National Energy Board of Canada (www.neb.gc.ca)

(Note: These sources differ as to their level of objectivity, public availability, and scope of content.)

Important Statistics

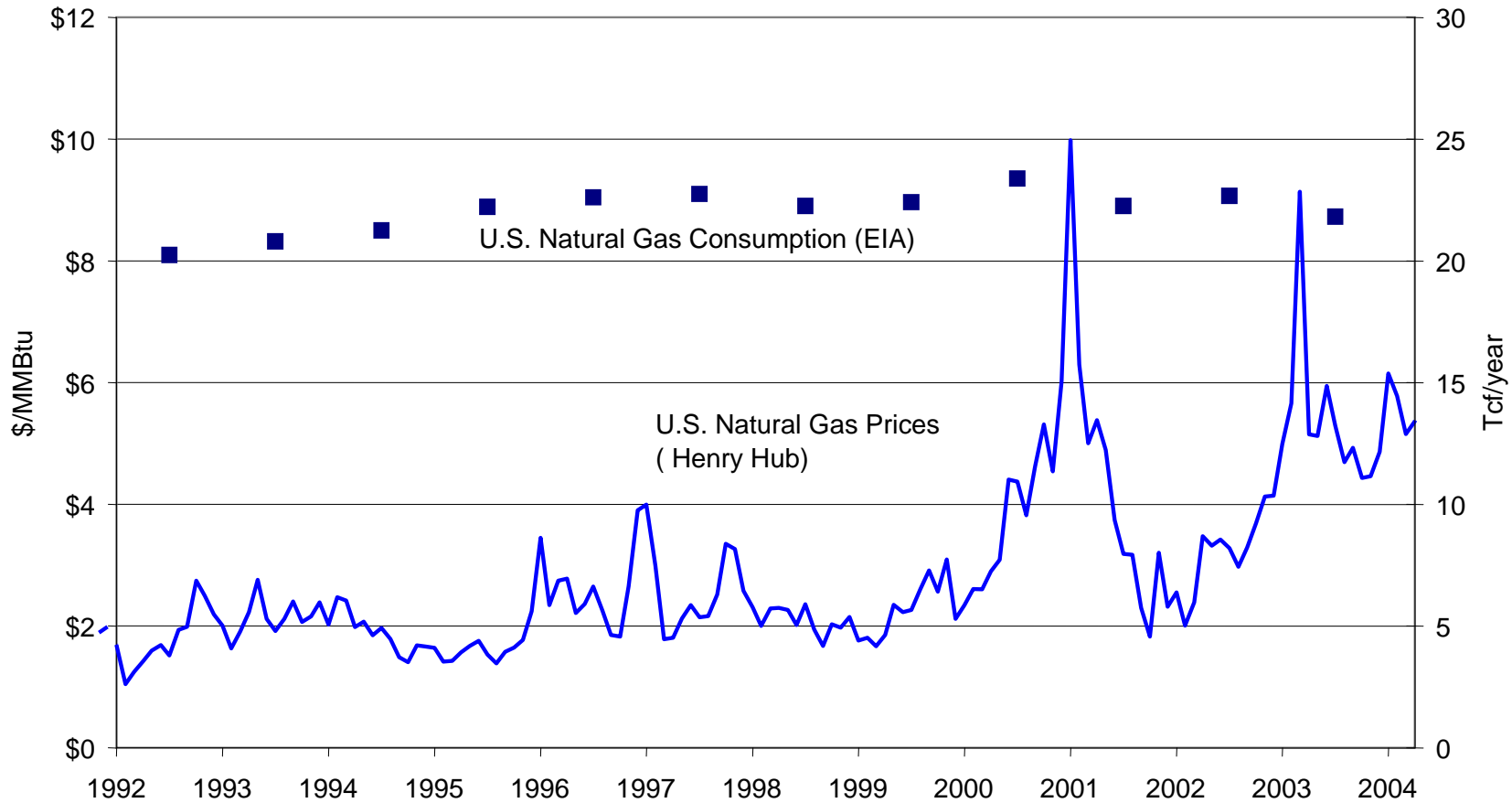
- Gas storage levels
- Behavior of Henry Hub natural gas prices over the past few years
- NYMEX futures prices over the next several months or years
- Price projections from other sources
- Consumption levels
- Projected gas bills for the upcoming winter

Important Statistics -- *continued*

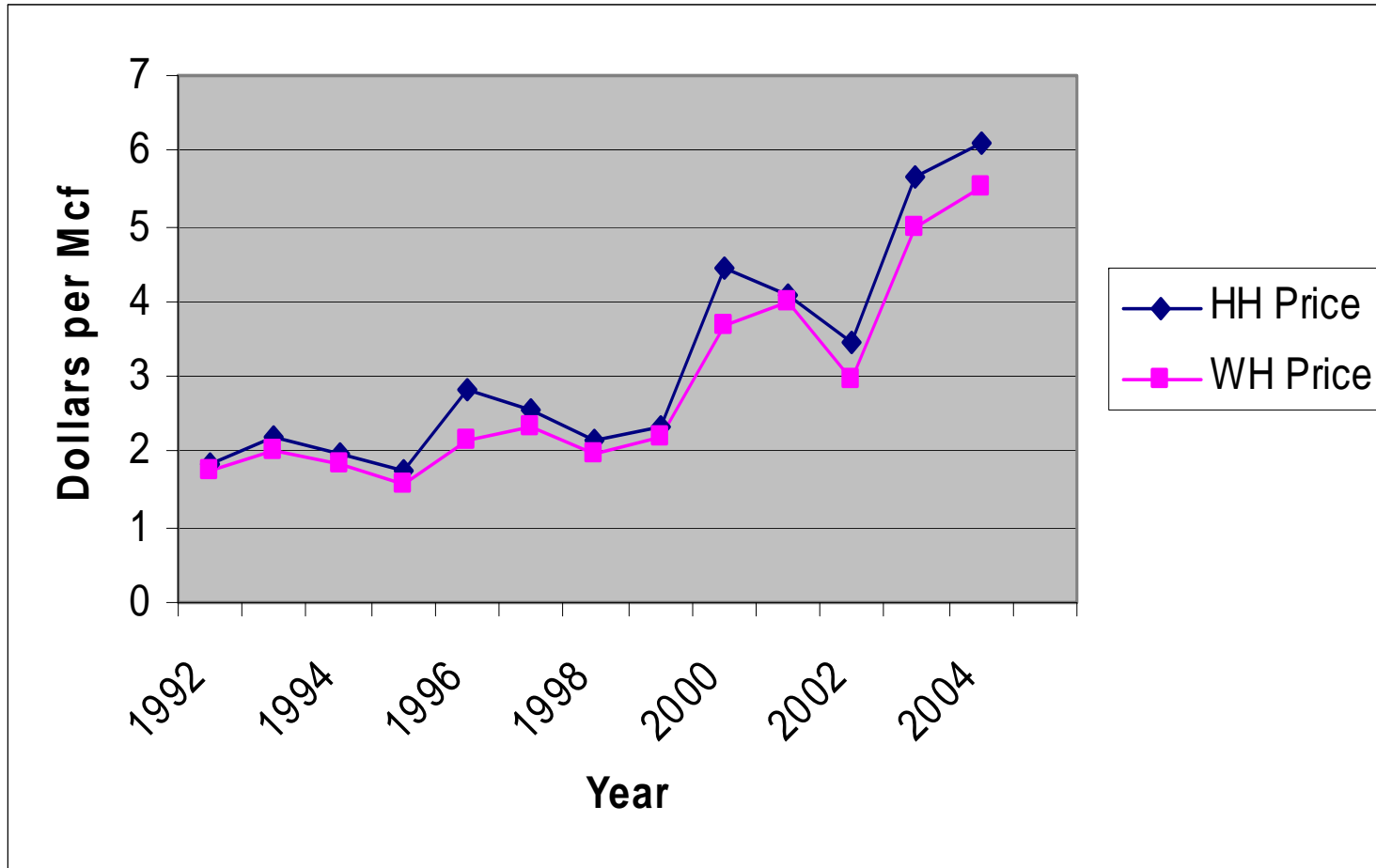
- Domestic gas production
- LNG imports
- Canadian imports
- Rig counts
- Well completions
- Oil prices

Short-Term Perspective

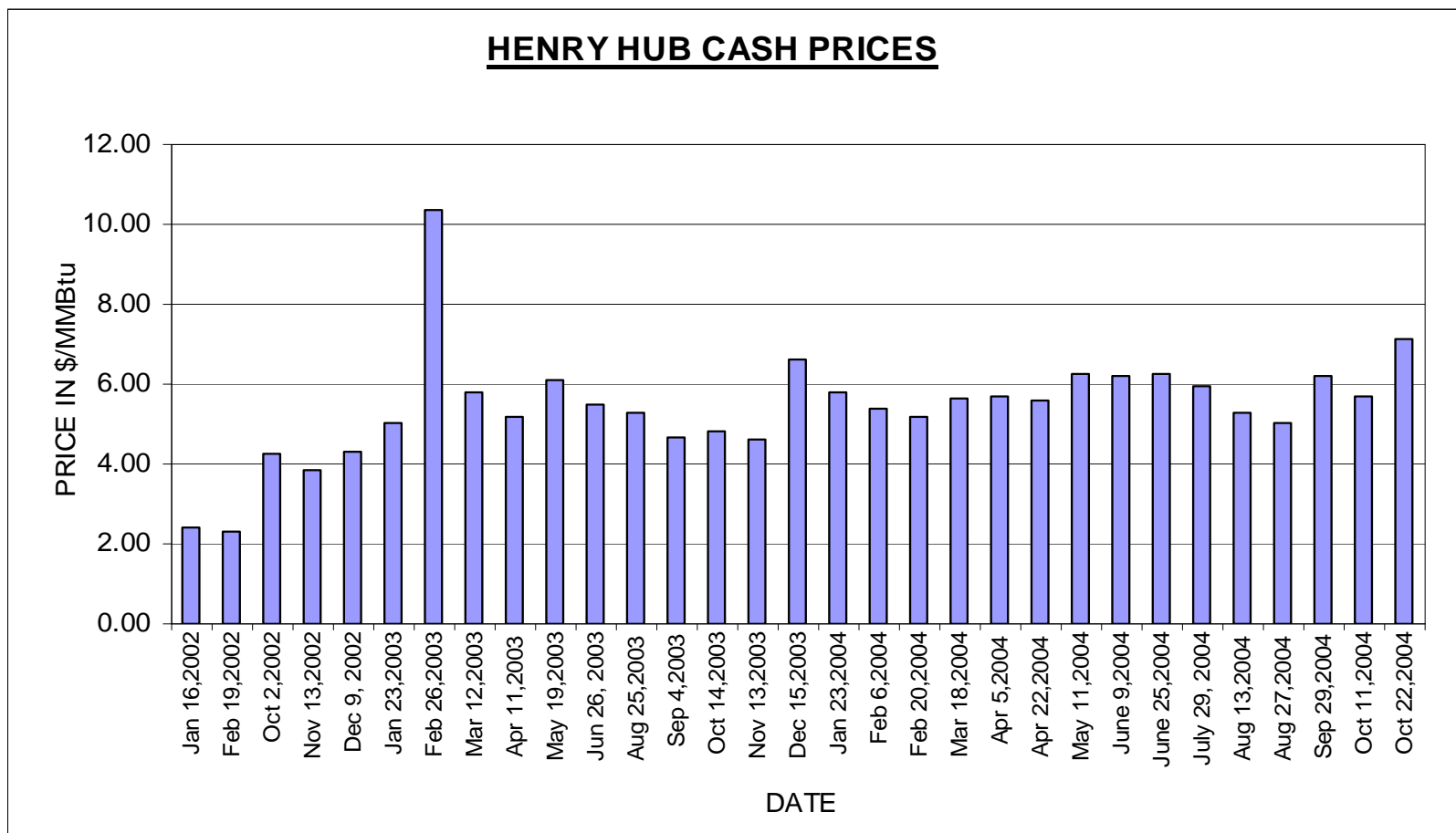
U.S. Natural Gas Demand and Prices Since 1992



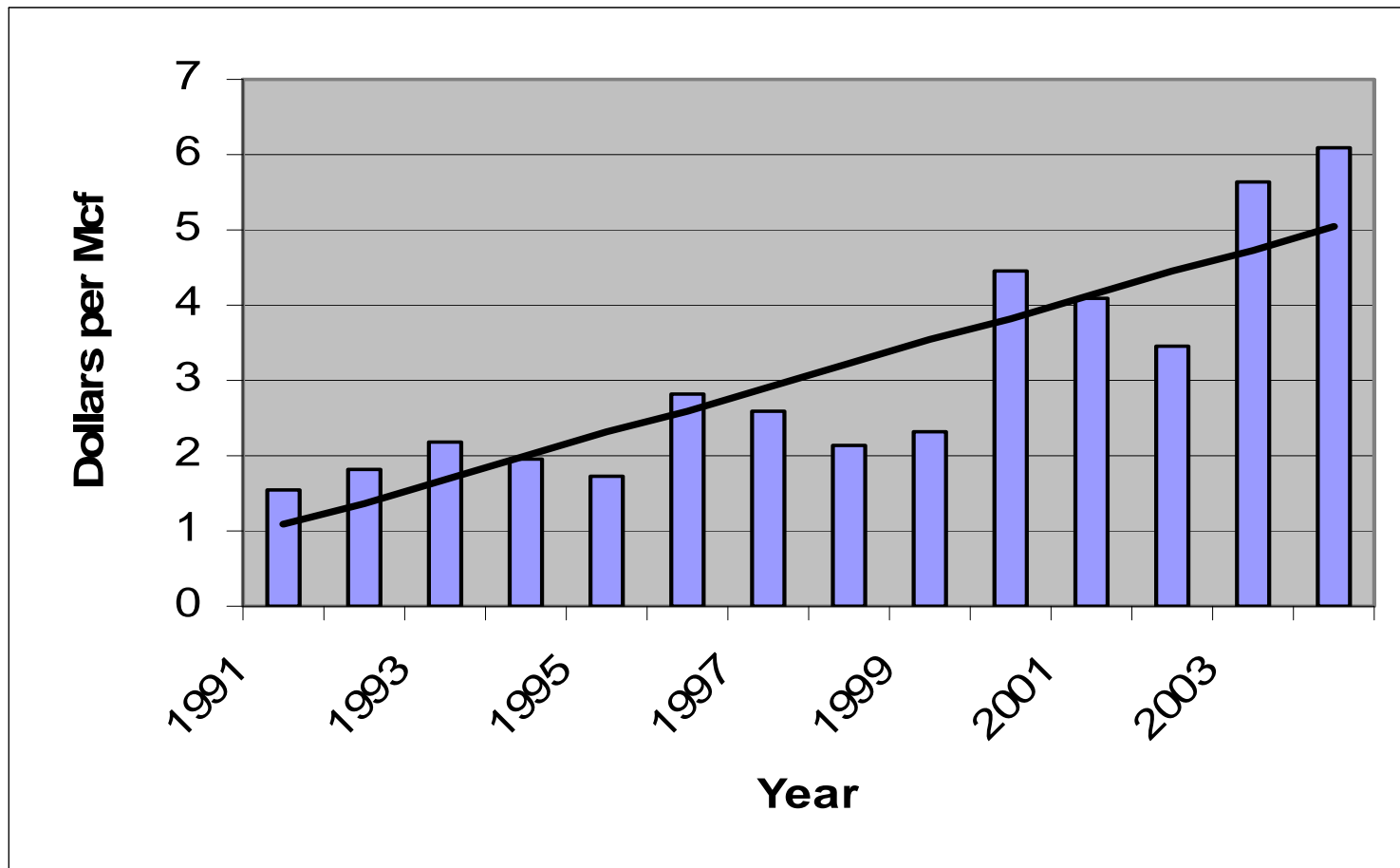
Henry Hub/Wellhead Average Annual Prices, 1992-2004



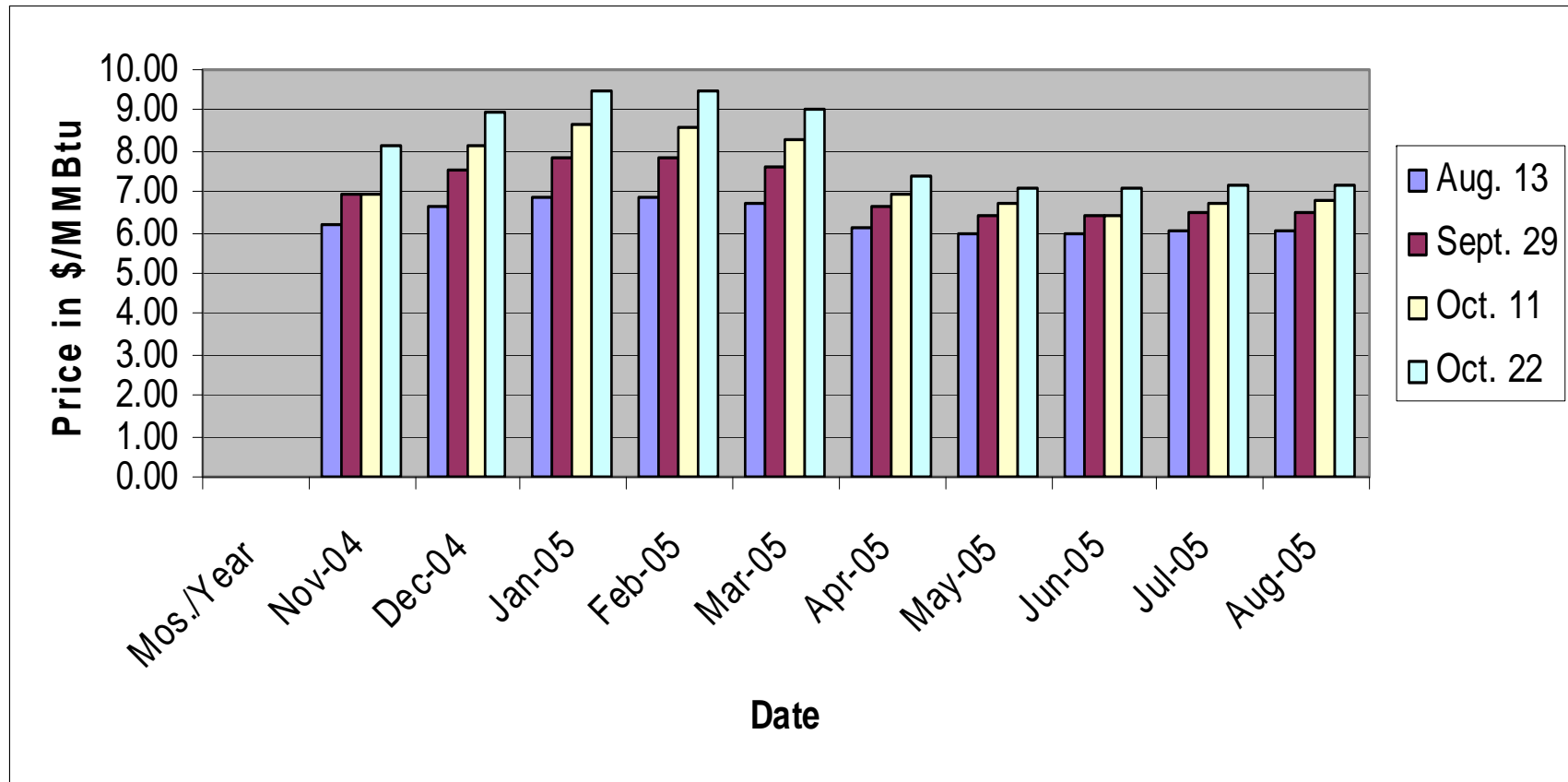
Henry Hub Natural Gas Prices, January 2002- October 22, 2004



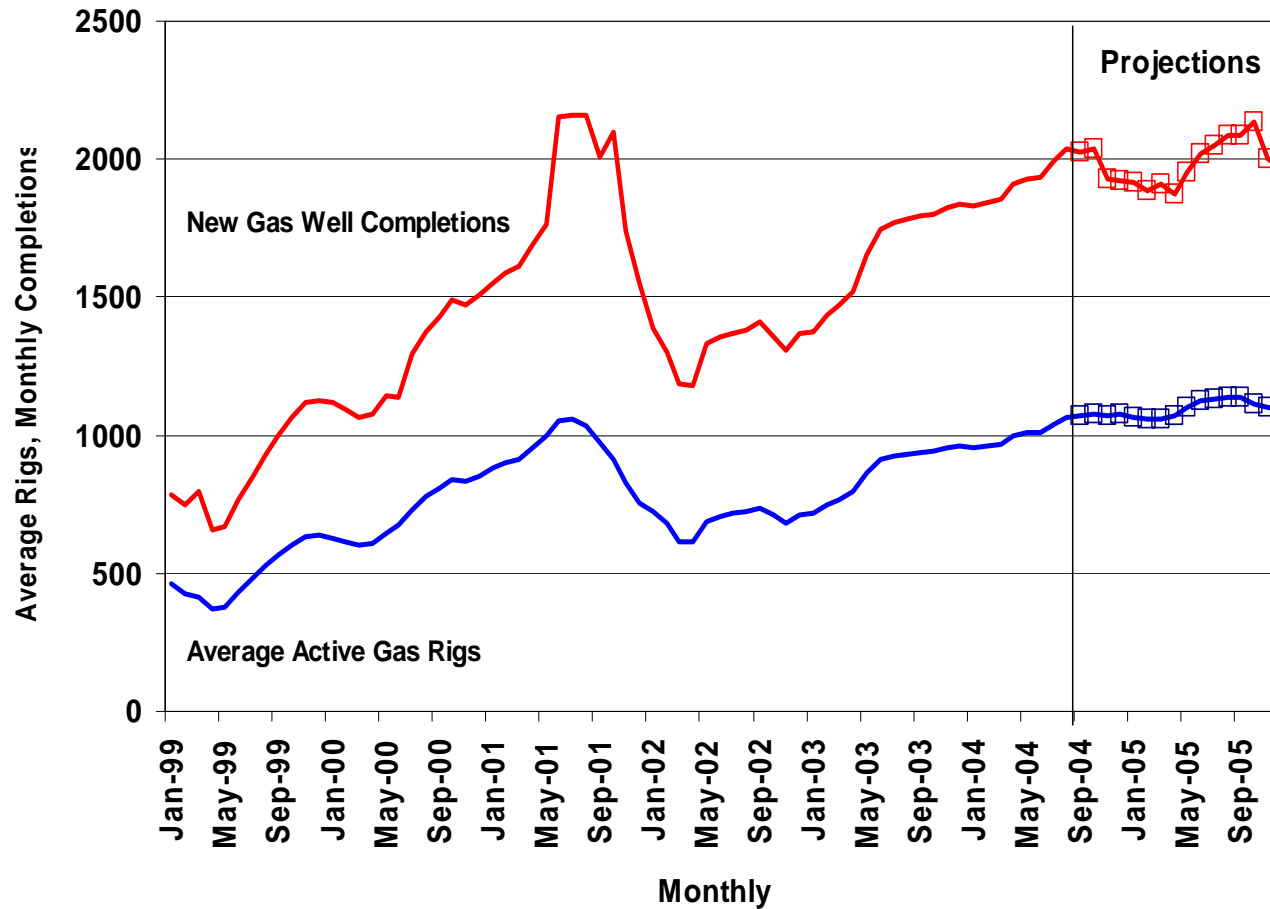
Henry Hub Average Annual Price, 1991-2004



Changes in NYMEX Futures Prices, during the Period August 13-October 22, 2004



U.S. Natural Gas-Directed Drilling Activity



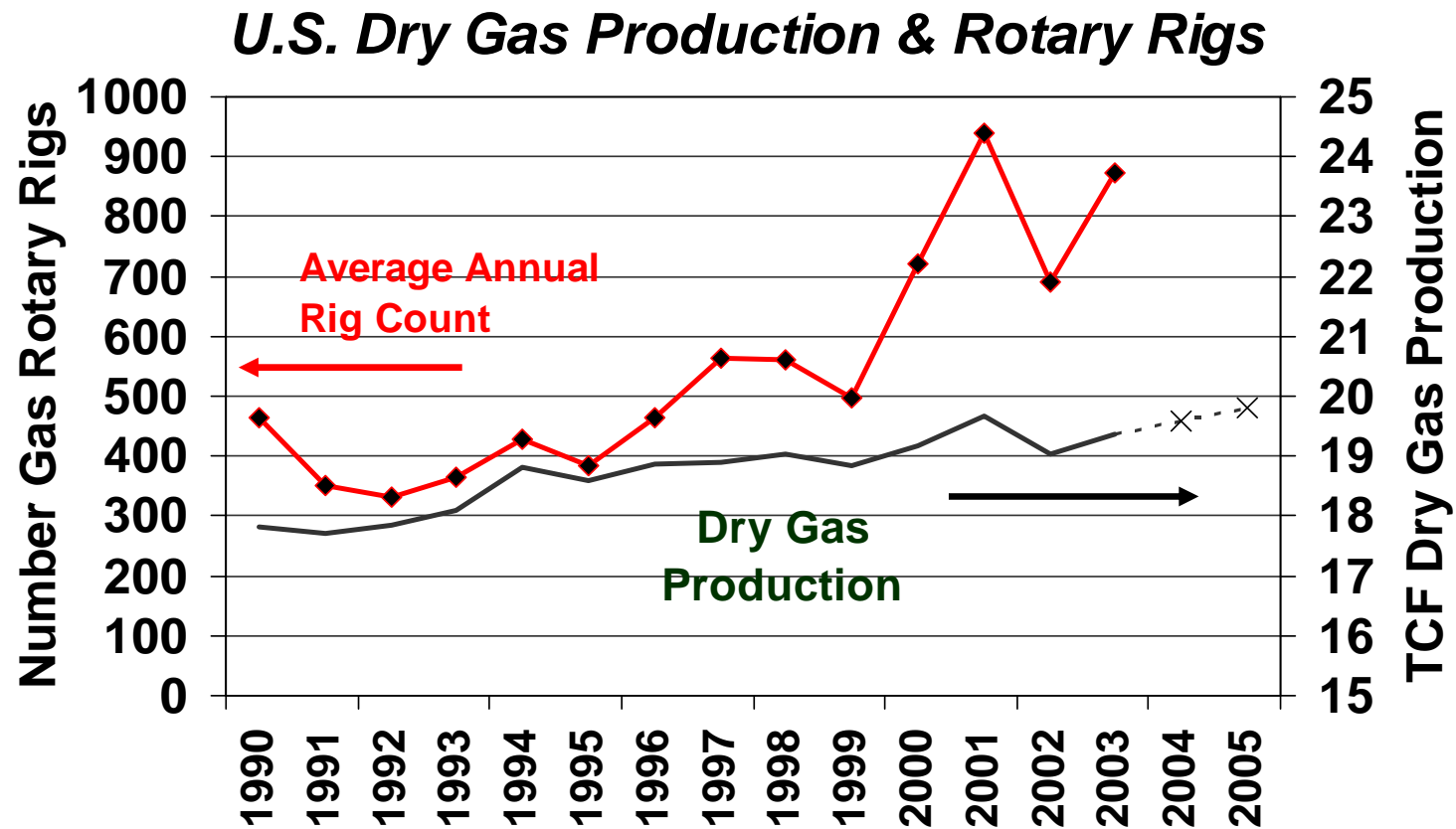
Short-Term Energy Outlook, October 2004

NRRI -- October 27, 2004

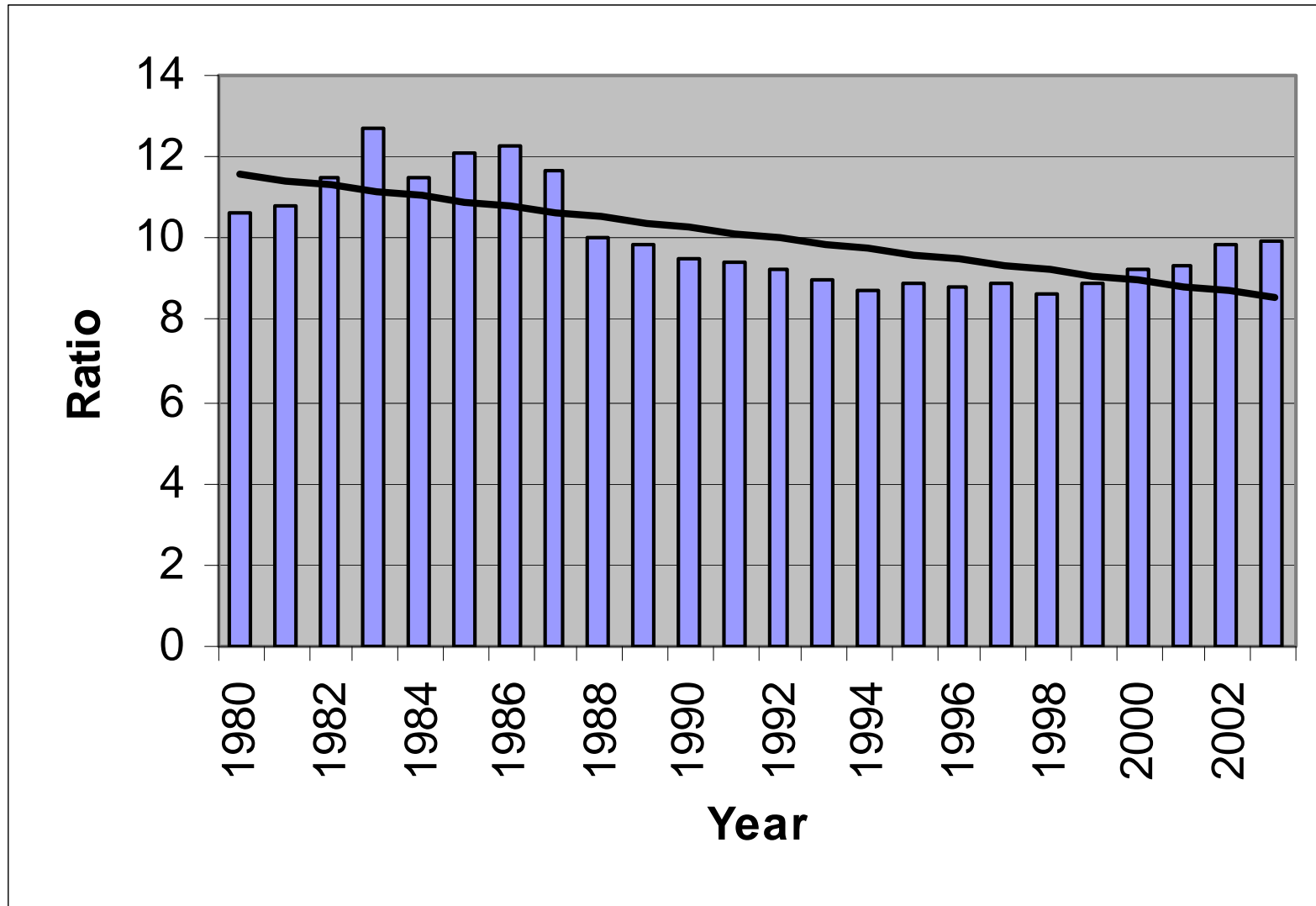


Large Increase in Supply Rigs Shows Little Effect on Production Since 2000

(source: EIA and Baker Hughes)

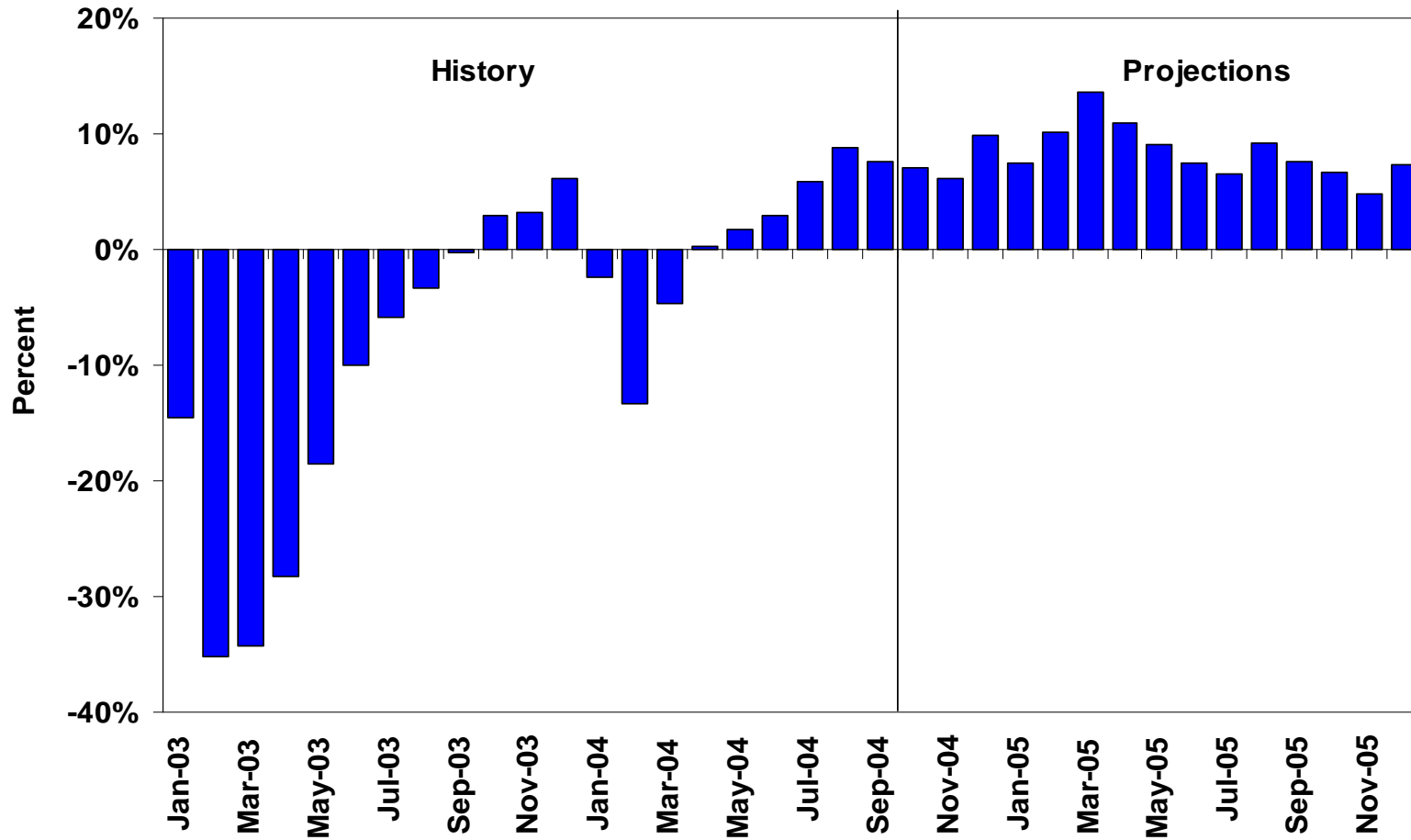


Proved Reserves/Production Ratio, 1980-2003



NRRI -- October 27, 2004

U.S. Working Gas in Storage (Percent Difference from Previous 5-Year Average)



EIA's Short-Term Projections (as of March 2004)

- **Wellhead price:** \$4.75 per Mcf in 2004, \$4.82 in 2005
- **Consumer prices:** expect relief starting in 3Q 2004
- **Consumption:** some recovery in 2004 from decrease in 2003
- **Supply:** *Cautious Optimism* because of
 - Production increases expected in 2004 and 2005
 - Net imports (including LNG) increase in 2004
 - Storage levels adequate

EIA's Short-Term Outlook for Natural Gas (as of August 30, 2004)

- **Continued tight gas market**
 - No short-term relief anticipated
- **Consumption:** flat growth in 2004 and 2005
- **Domestic production:** marginal growth through 2005
- **New well completions offset by the production declines for existing wells**
- **Net imports**
 - Slight increase in 2004 and then decrease in 2005
 - Increased LNG imports are offset by decreased pipeline imports from Canada

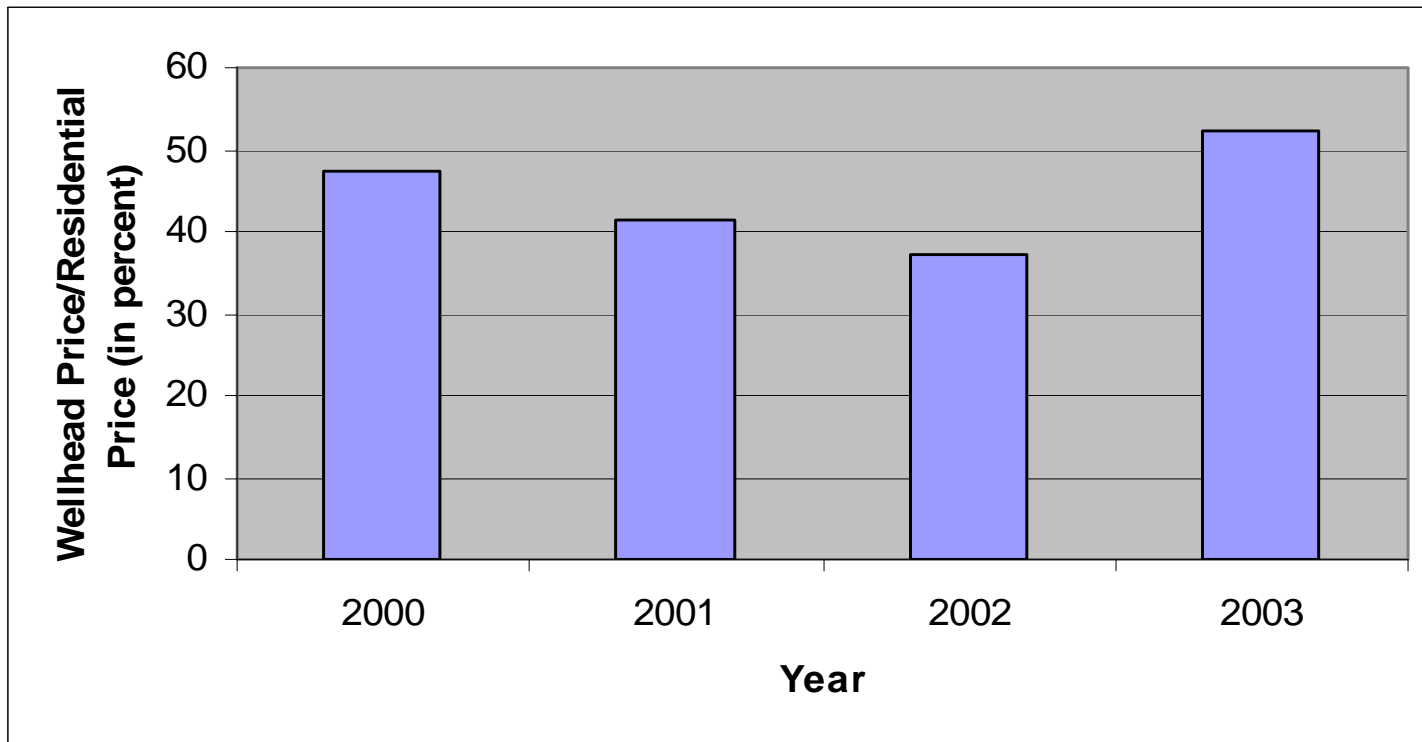
EIA's Short-Term Outlook for Natural Gas (as of October 6, 2004)

- **Wellhead price:** \$5.52 per Mcf in 2004, \$5.63 in 2005
- **Oil price:** over \$40 (WTI) for next year
- **Domestic production:** 1.5% increase in 2005 because of intensive drilling
- **Consumption:** 2% increase in 2005
- **Moderate improvement in supply for 2005**
 - Increase in LNG imports (22%)
 - Restrained export growth
 - Storage carryover

EIA's 2004-2005 Winter Natural Gas Outlook (as of October 6, 2004)

- **WELLHEAD PRICE:** \$6.04 per Mcf (compared to \$4.92 per Mcf last winter, or an increase of almost 23%)
- **RESIDENTIAL CONSUMER PRICES (Midwest):** \$10.86 per Mcf (compared to \$9.77 per Mcf last winter, or an increase of 11%)
- **CONSUMPTION:** an increase of 1.5% over last winter's consumption
- **SUPPLY:**
 - Domestic natural gas production slightly higher than last winter's production
 - Net imports slightly higher than last winter's net imports
 - Storage levels adequate
- **WEATHER SCENARIOS:** a cold winter could significantly drive up gas expenditures (for example, a severe winter could drive winter gas bills up almost 17% from the base case)

Ratio of Wellhead Price to Delivered Residential Price



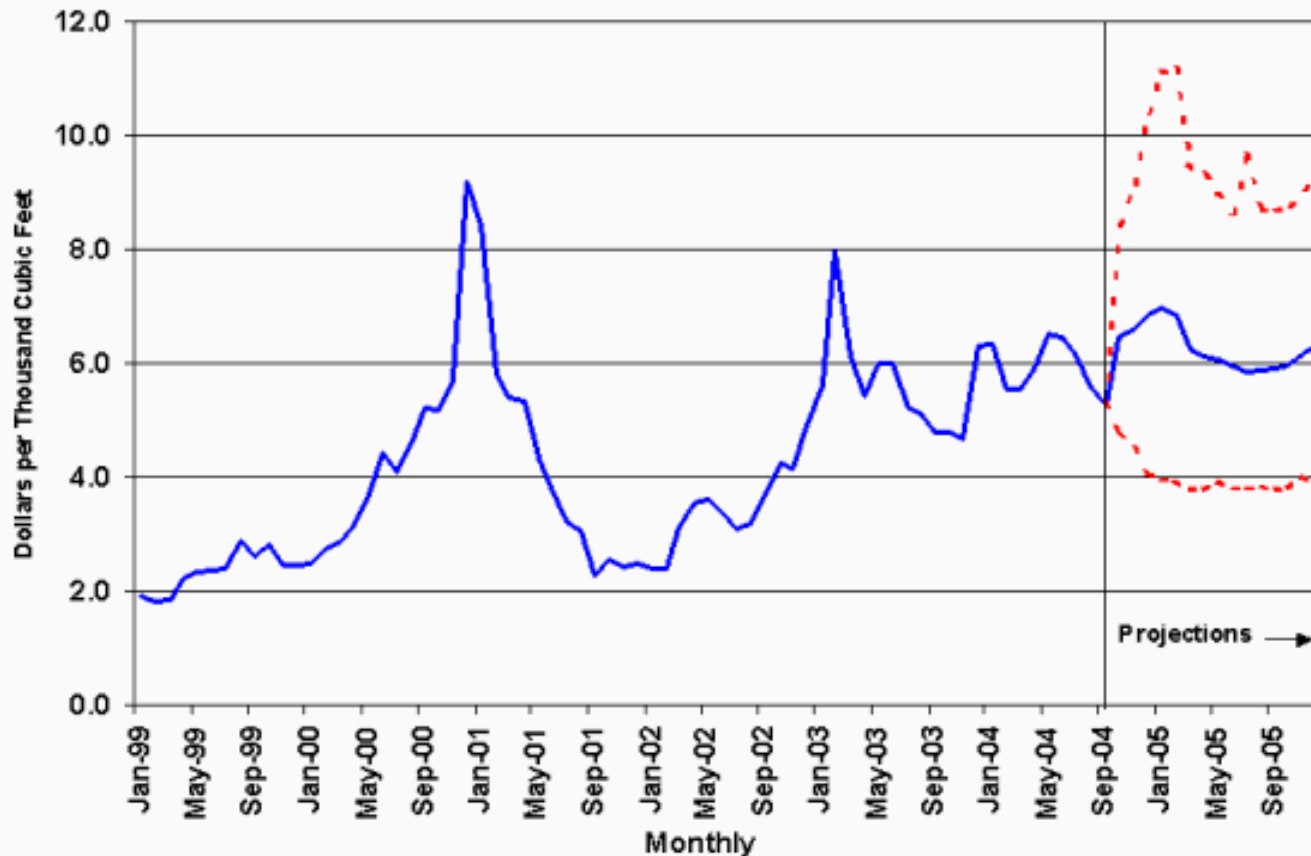
EIA Base Forecast (Source: *Winter Fuels Outlook: 2004-2005, October 2004*)

	Average 1998-2000	Actual 2001-2002	Actual 2002-2003	Actual 2003-2004	Projections 2004-2005	% Change
Natural Gas (Midwest)						
Consumption (m cf*)	88.8	81.3	94.9	89.1	92.3	3.7
Avg. Price (\$/m cf)	7.61	7.41	8.40	9.77	10.86	11.2
Expenditures (\$)	676	602	797	870	1003	15.3
Heating Oil (Northeast)						
Consumption (gallons)	673	577	743	700	698	-0.3
Avg. Price (\$/gallon)	1.12	1.10	1.34	1.36	1.75	28.8
Expenditures (\$)	754	637	995	953	1223	28.4
Propane (Midwest)						
Consumption (gallons)	877	803	940	882	914	3.7
Avg. Price (\$/gallon)	1.10	1.11	1.20	1.30	1.53	17.3
Expenditures (\$)	965	888	1124	1147	1396	21.6

Consumption based on typical per household use for regions noted. Prices are retail national averages.

*thousand cubic feet.

**Figure 6. U.S. Natural Gas Spot Prices
(Base Case and 95% Confidence Interval*)**



*The confidence intervals show +/- 2 standard errors based on the properties of the model. The ranges do not include the effects of major supply disruptions.

Sources: History: Natural Gas Week; Projections: Short-Term Energy Outlook, October 2004.



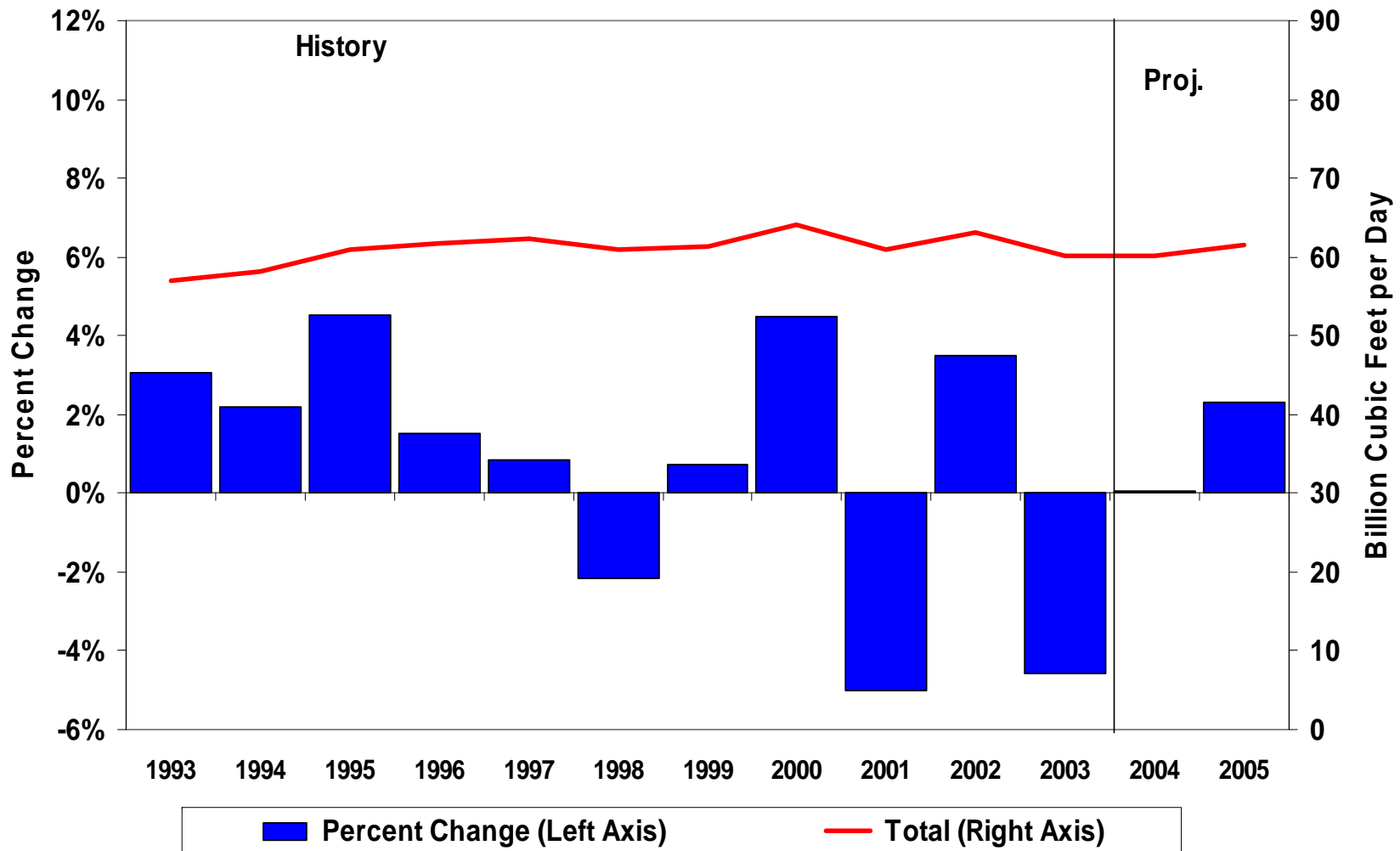
EIA's 2004 and 2005 Projections

	2003	2004	2005
LNG Imports (Bcf)	510	680	830
Average Wellhead Price (\$/Mcf)	\$4.98	\$5.52	\$5.63
Average Henry Hub Price (\$/Mcf)	\$5.64	\$6.10	\$6.18
Residential Gas Price (\$/Mcf)	\$9.50	\$10.60	\$11.12

Comparison of 2005 Henry Hub Price Forecasts (source: NGSa study)

EIA	\$6.16 (\$6.18, update)
Lehman Brothers	\$5.50
Raymond James and Associates	\$6.65
SEER	\$6.55 (\$6.19, update)
EEA	\$6.45
Stephen Smith Energy Associates	\$5.50
Average	\$6.14

Total U.S. Natural Gas Demand Growth



Short-Term Energy Outlook, October 2004

NRRI -- October 27, 2004

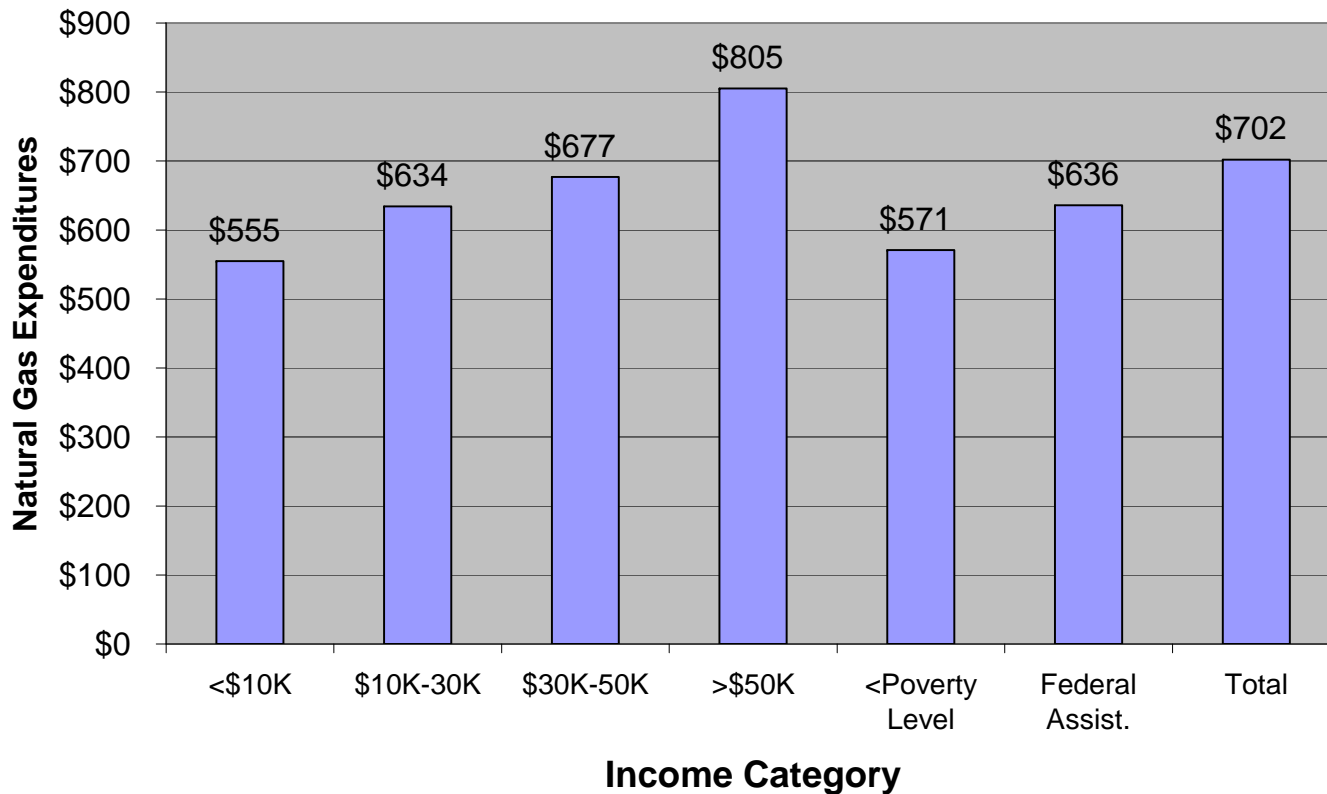


“Demand Destruction” in the Industrial Sector

- Aluminum smelter closings
- Ammonia production reductions
- Industrial plant closings
- Fuel-switching
- Industrial process adjustments

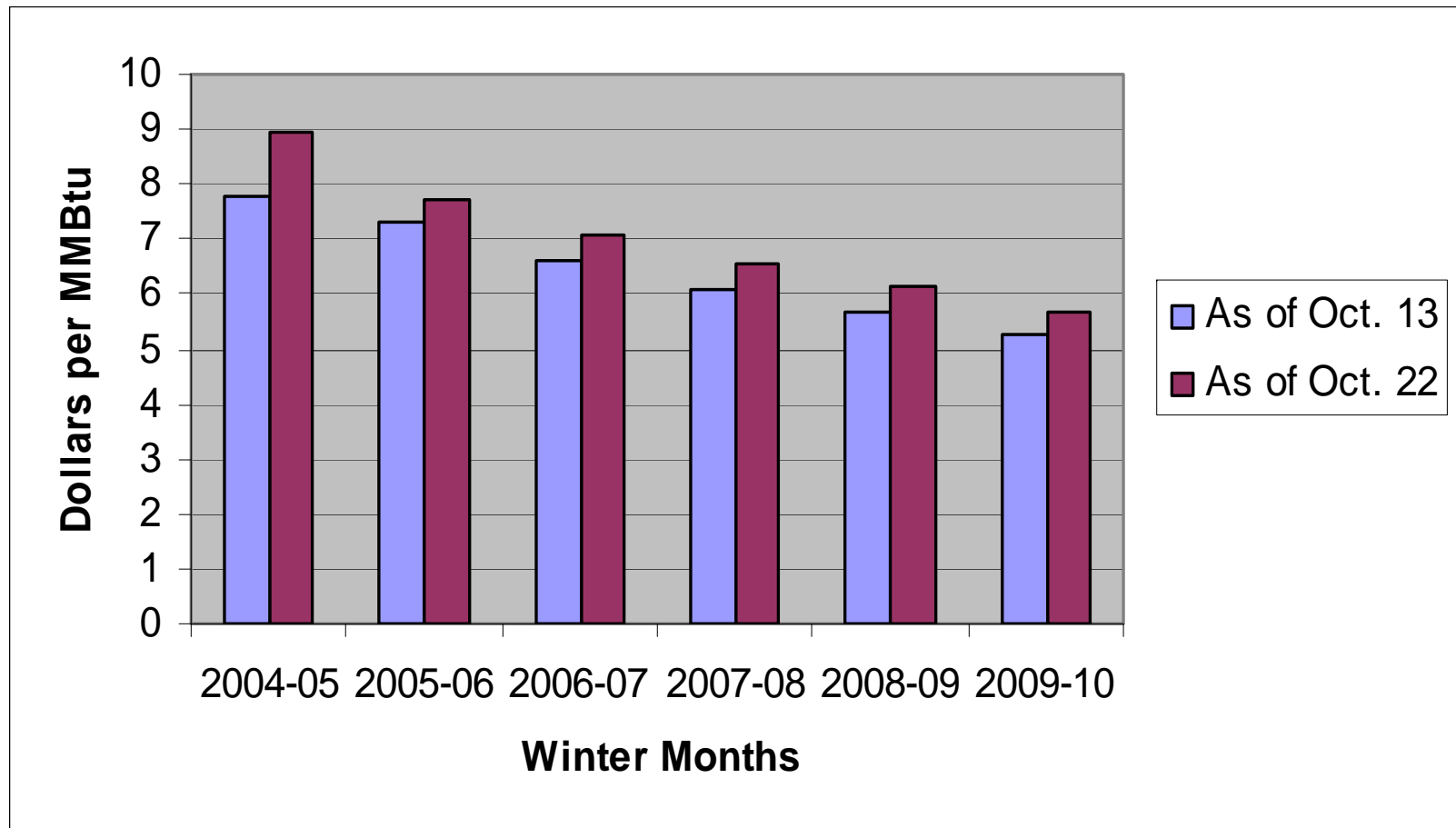
Natural Gas Expenditures for Space Heating Customers by Income Category, 2001

Natural Gas Expenditures by Income Category, 2001

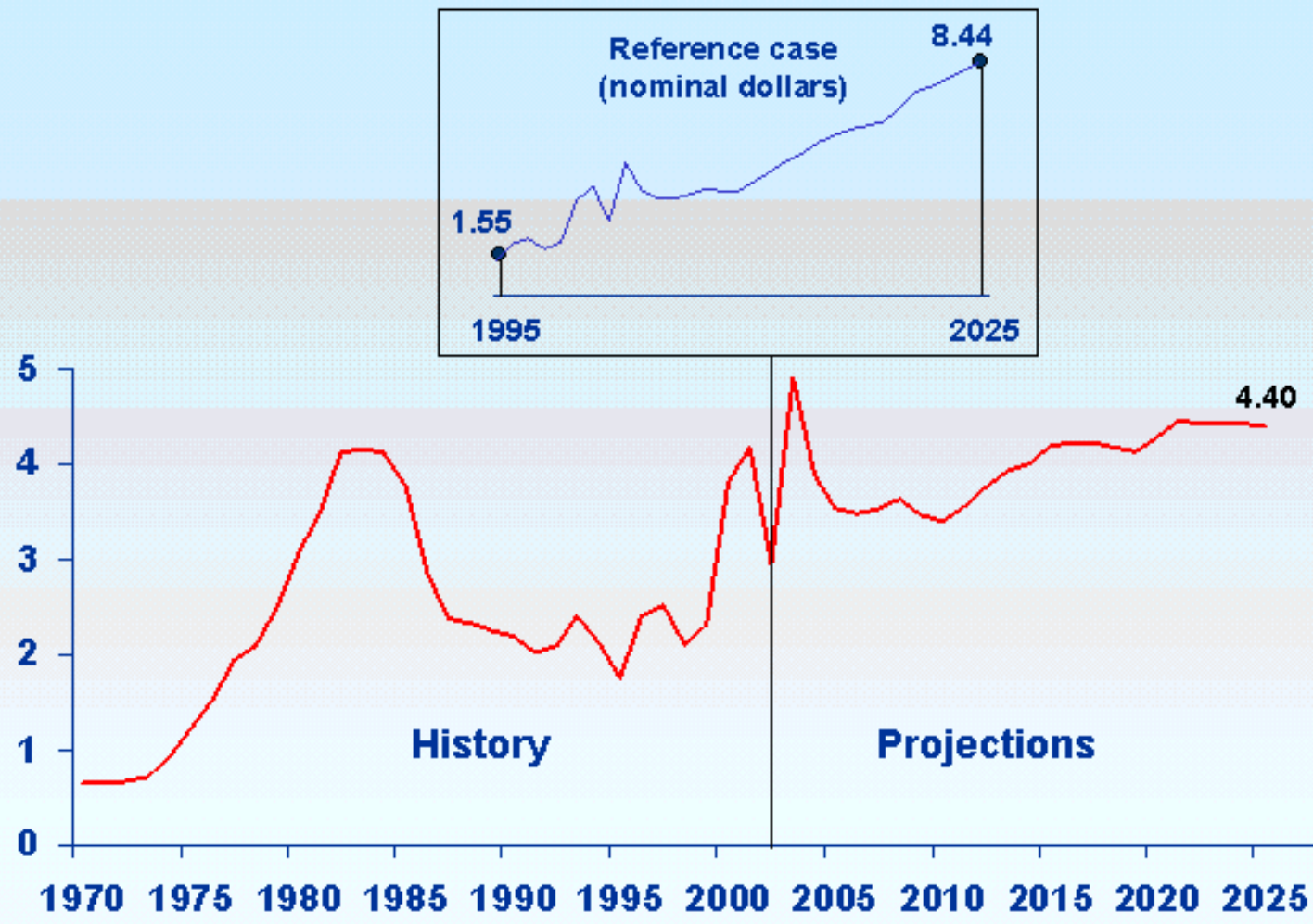


Longer-Term Perspective

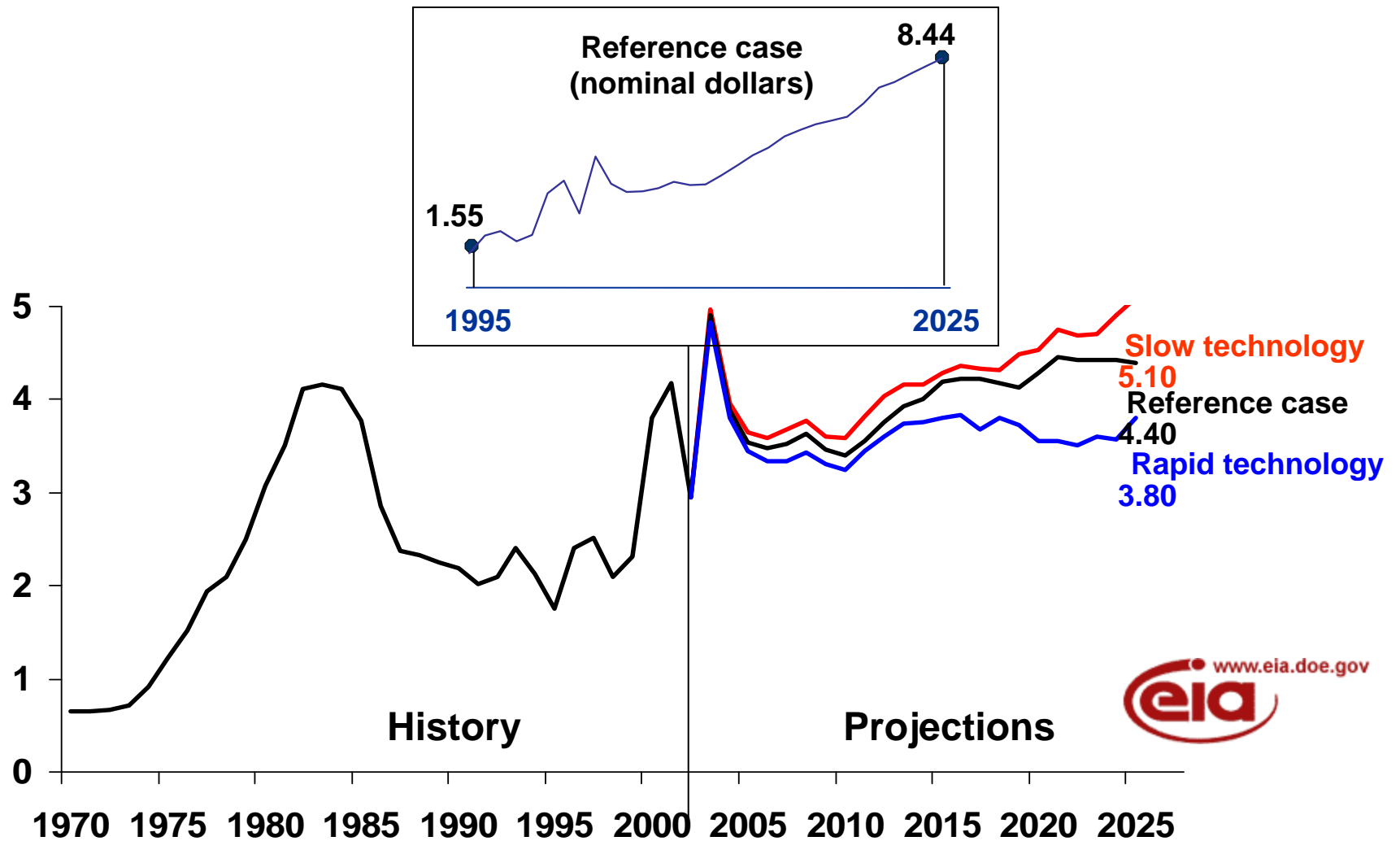
Average NYMEX Winter Futures Prices, 2004-2010



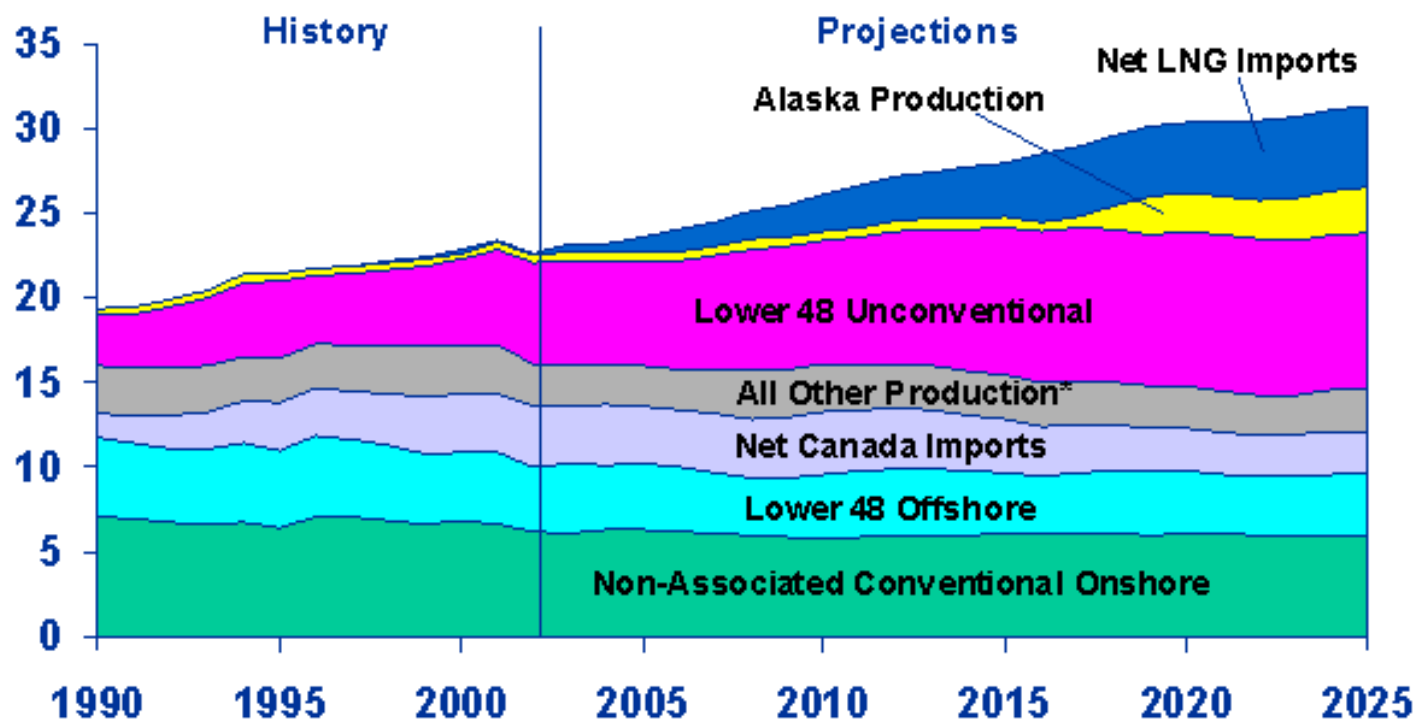
Lower 48 Natural Gas Wellhead Prices, 1970-2025 (2002 dollars per thousand cubic feet)



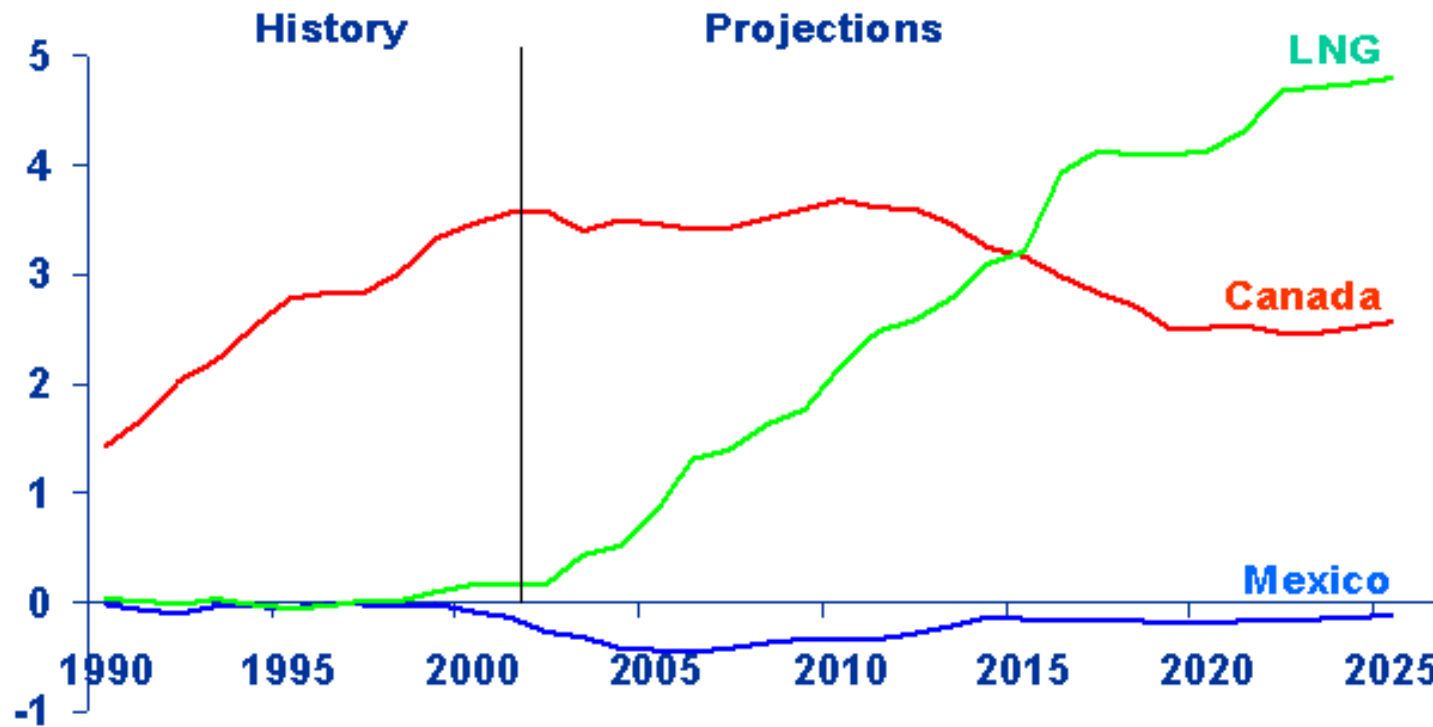
Lower 48 Natural Gas Wellhead Prices, 1970-2025 (2002 dollars per thousand cubic feet)



Natural Gas Supply, 1990-2025 (Tcf) (source: EIA)



U.S. Natural Gas Net Imports, 1990-2025 (Tcf) (source: EIA)



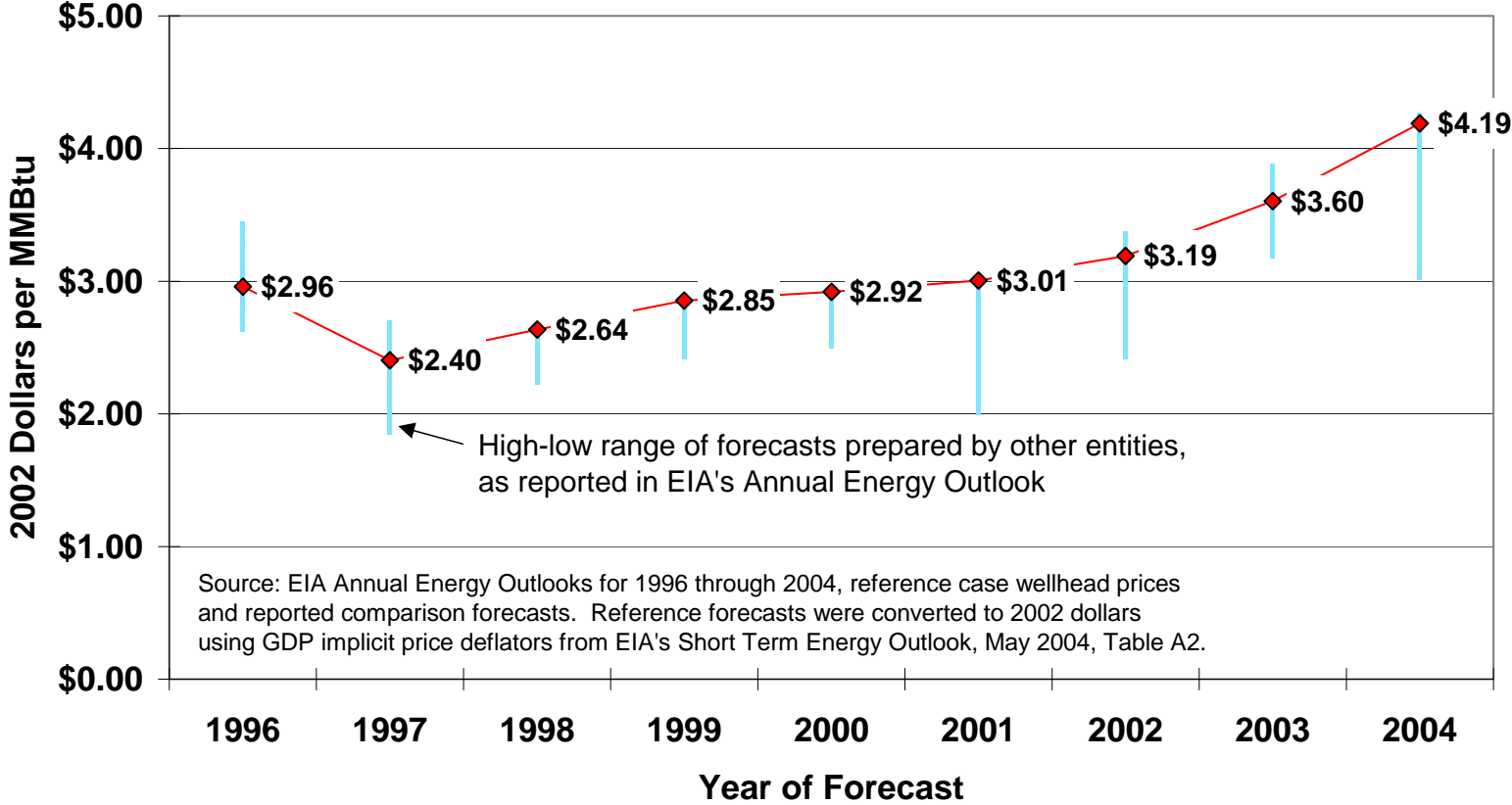
Shift in Long-Term Supply Perspectives since 1999

Projections of Lower 48 Natural Gas Production (Tcf)

	2010	2015
AEO 1999	23.09	25.40
AEO 2003	21.40	23.28
AEO 2004	19.90	20.98
AEO 2005	20.49	20.85
NPC 1999	24.60	26.00
NPC 2003	18.90	19.70

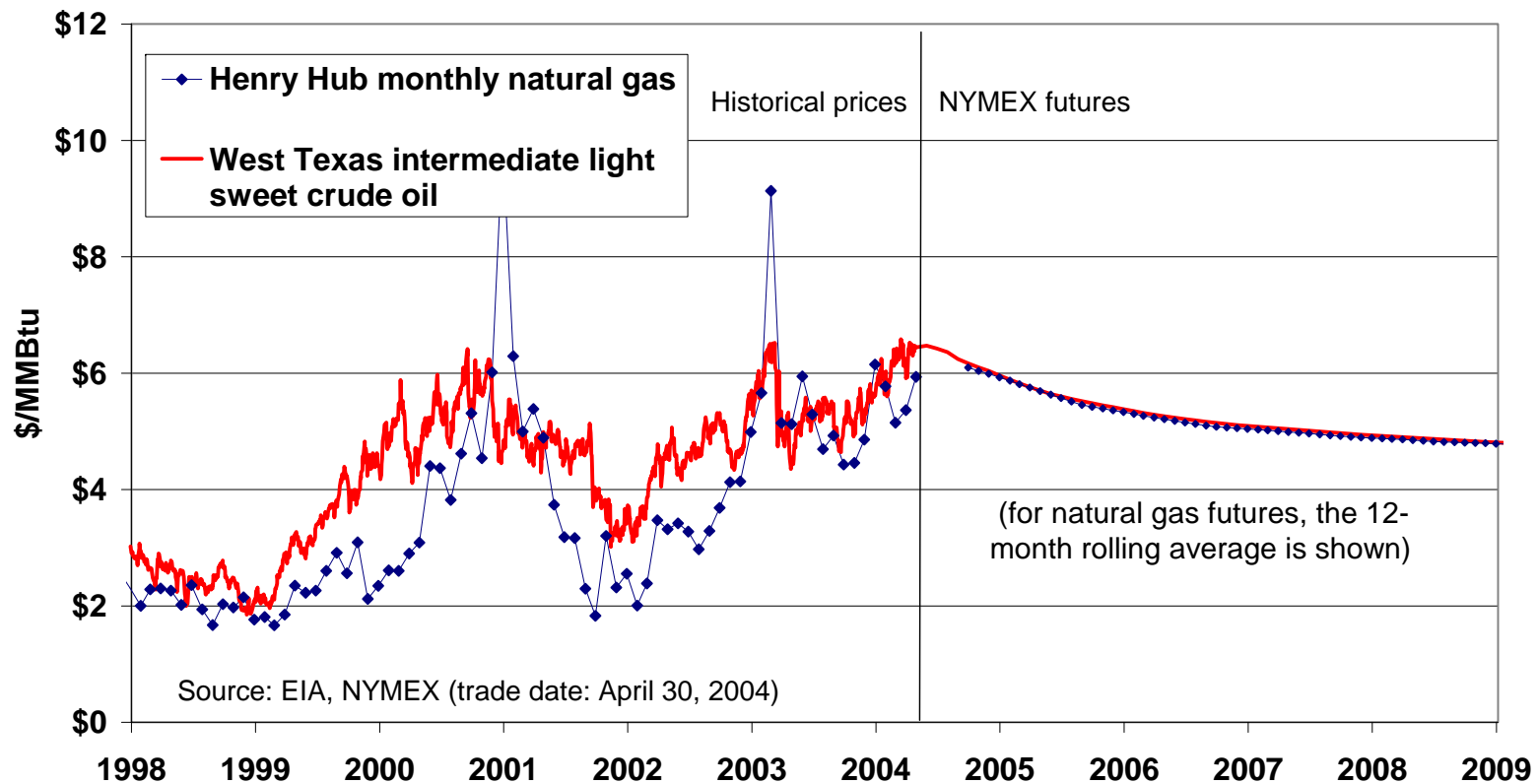
Upward Revision of EIA's Forecast Since 1996

EIA Forecasts of U.S. Natural Gas Prices, 2015



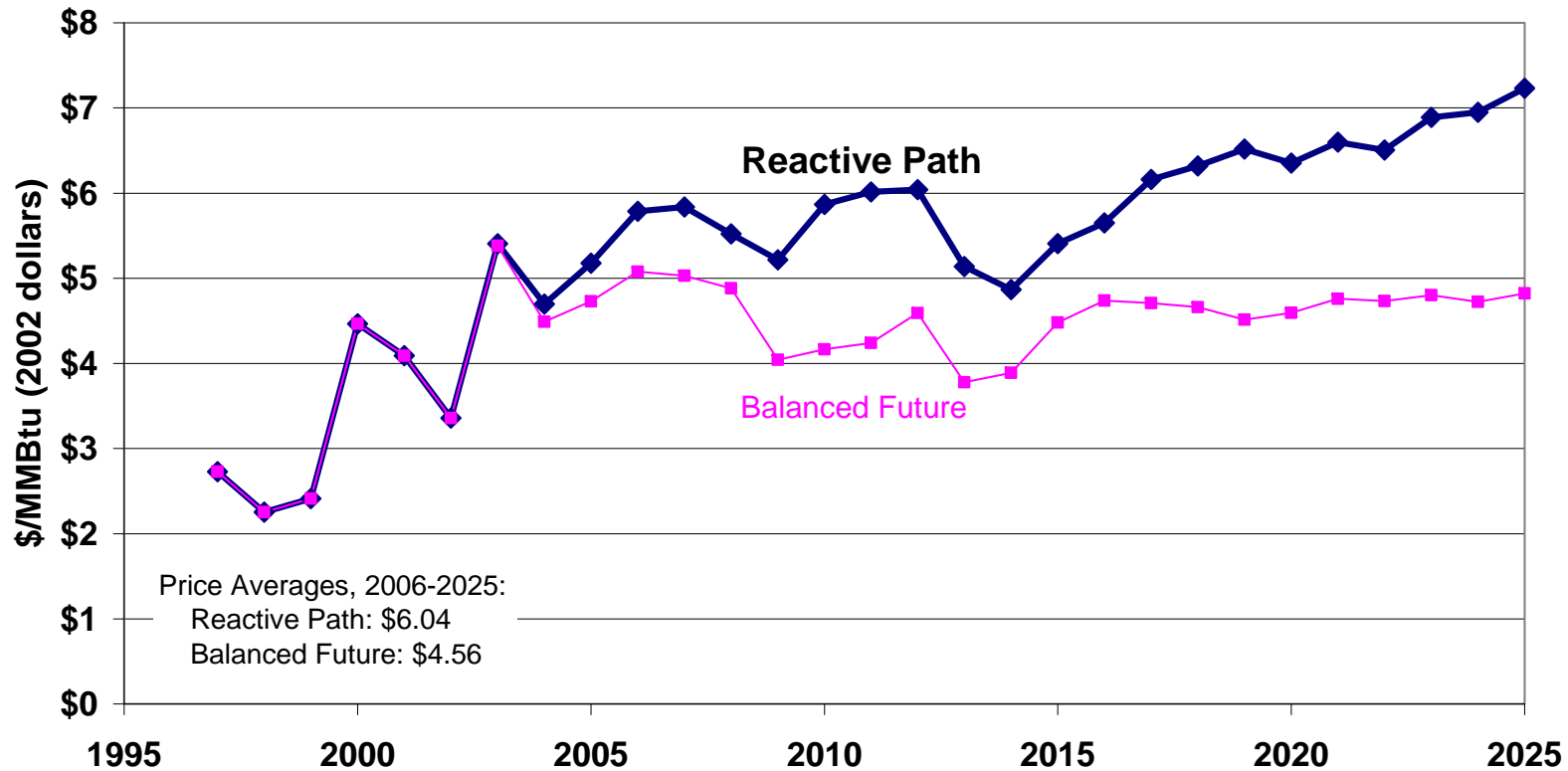
High Correlation Between Oil and Natural Gas Prices

Natural Gas and Crude Oil Prices and Futures



NPC's Projected Prices: Potential Benefits from Policy Initiatives

Reactive Path Scenario



National Energy Board Study:* Parallels in the U.S. and Canadian Gas Situation

- Continued tight gas market
- Concern about period between now and end of decade, as adjustments of demand and supply to high gas prices may be limited
- Question of where gas will come from to satisfy demand until end of the decade
- In a tight gas market, electric generators and core markets likely to bid gas away from the industrial sector

* *Looking Ahead To 2010: Natural Gas Markets in Transition*, August 2004.

National Energy Board Study -- continued

- *Major recent market developments*
 - Continental gas production is flattening out
 - Gas prices have risen and have been very volatile
 - High prices have had strong impacts on gas demand for gas-intensive industrial firms
 - Electric generation has emerged as major source of gas demand
 - Reduction in liquidity in market (demise of energy traders and marketers)
 - Natural gas is becoming a premium fuel

National Energy Board Study -- continued

- North American gas prices are increasingly influenced by the
 - Cost of alternative fuels
 - Rising costs of finding and bringing new gas supply to market
- With tighter environmental restriction limiting the range of fuel options and increasing the demand for gas, gas prices will be higher and closer to range *set by lighter distillate fuel oils*

National Energy Board Study -- continued

- “The general consensus among [study] participants was that out of the 40 current proposals for new LNG terminals in North America, only two or three new LNG projects would likely be in service by 2010.”