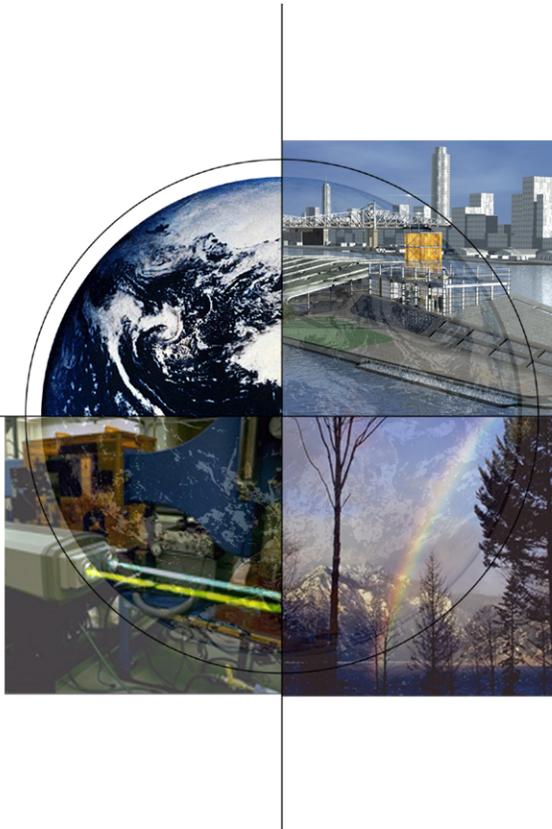


Future Trends in the Natural Gas Market



*2004 Conference on
Reburning for NO_x Control
“Reburning on Trial”*

May 18, 2004

National Energy Technology Laboratory



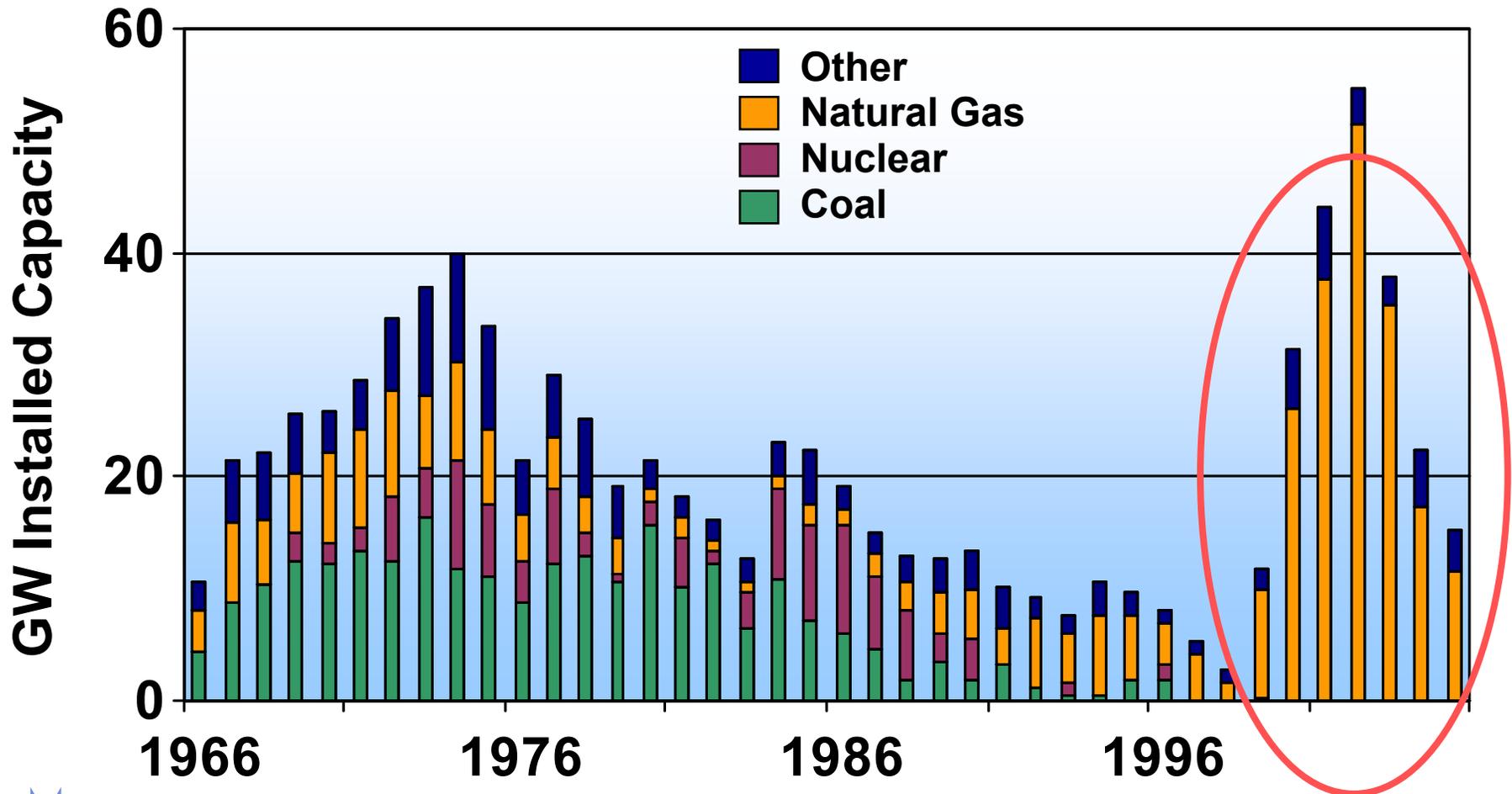
Topics

- **Decline in North American natural gas supply following unprecedented gas-fired generation growth**
- **National Petroleum Council natural gas report (9/03) raises supply issues also reflected in AEO 2004**
- **Forecast for domestic and foreign LNG industry developing to fill a natural gas BTU void**
- **Natural gas price drivers in near-to-mid term**
- **Current natural gas price forecasts**



200+ GW of New Gas-Fired Capacity Since 1998

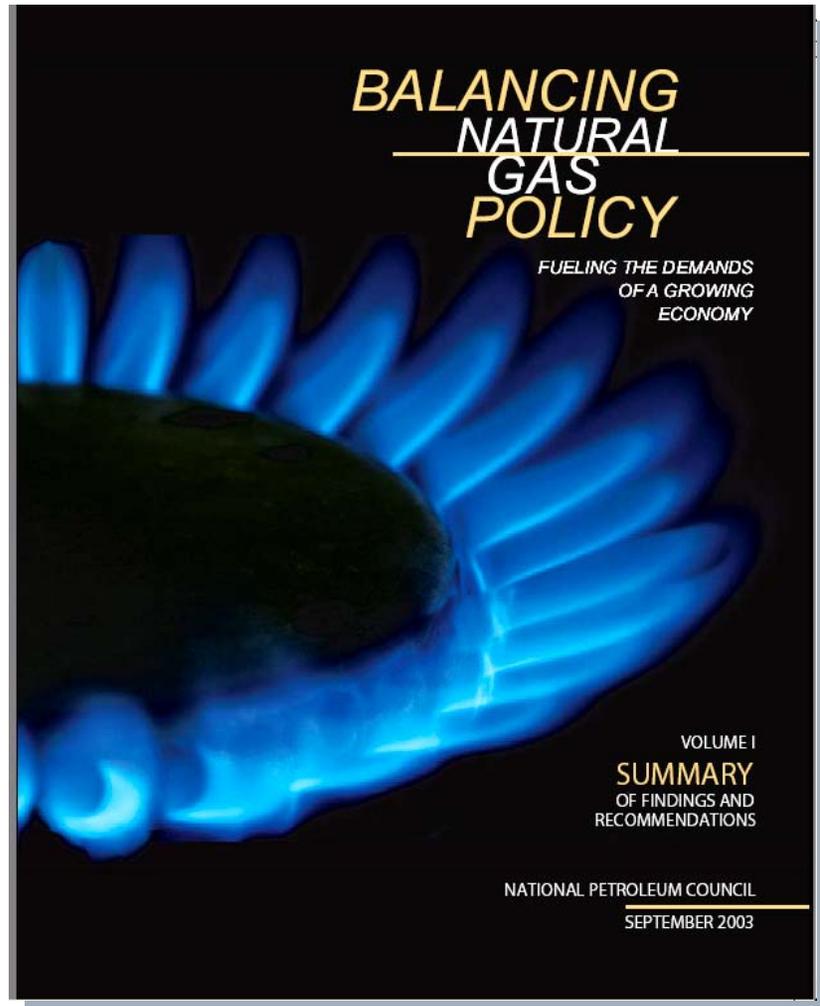
U.S. Generation Capacity Additions



NPC 2003 Natural Gas Study

September 2003

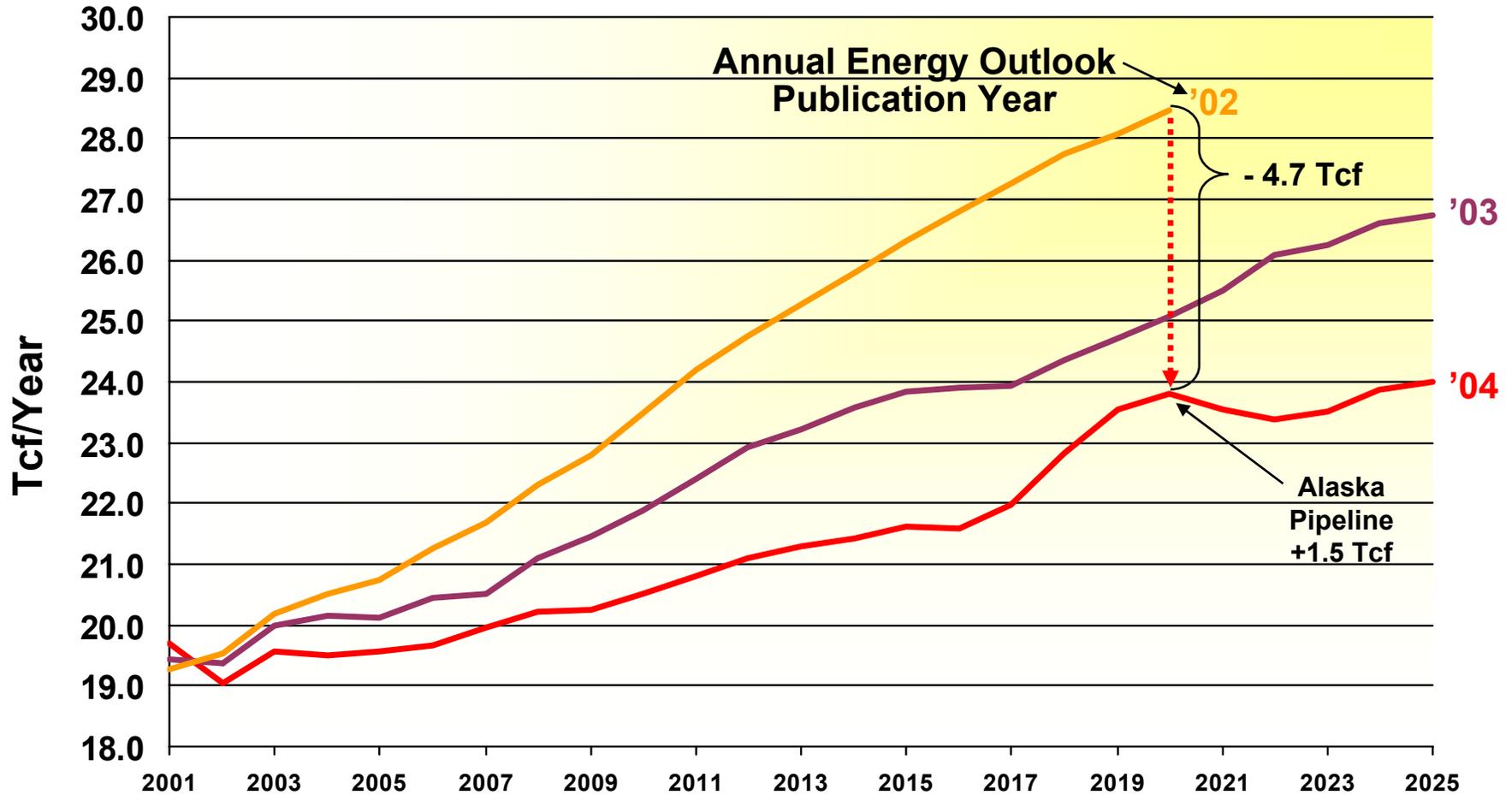
- 18-month comprehensive assessment of N. American supply & demand
- Broad industrial participation



Higher Prices Reflect Fundamental Shift in Supply / Demand Balance

- **Traditional North American gas-producing areas**
 - Can only supply 75% of projected demand
 - At best, production remains flat
- **New large-scale resources (LNG, Arctic) could meet 20 – 25% of demand**
 - Have higher cost, long lead times, development barriers

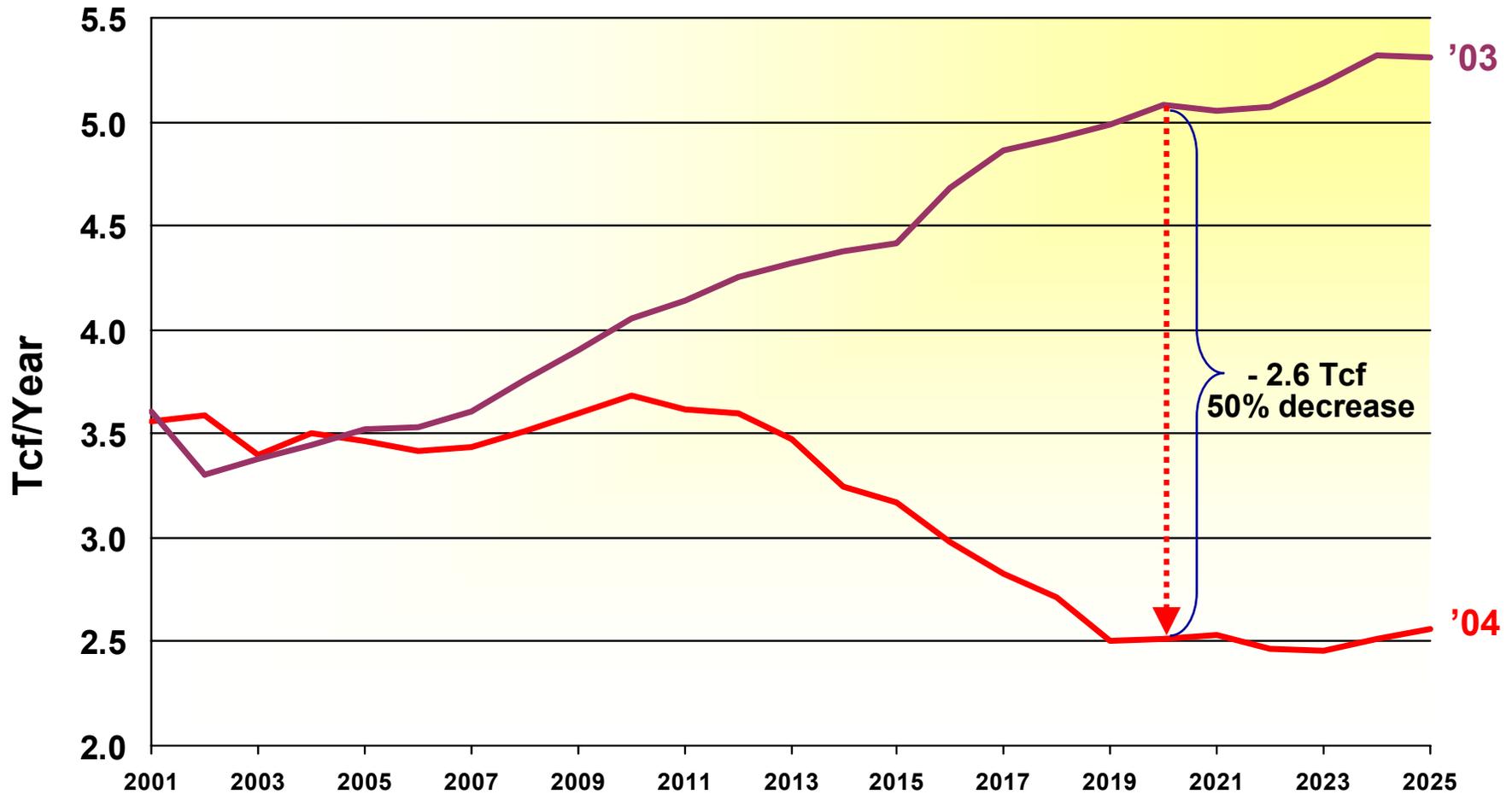
Declining Domestic Natural Gas Production Forecast



A 22% Decline If Not Mitigated by Alaskan Pipeline (+1.5 Tcf in 2020)



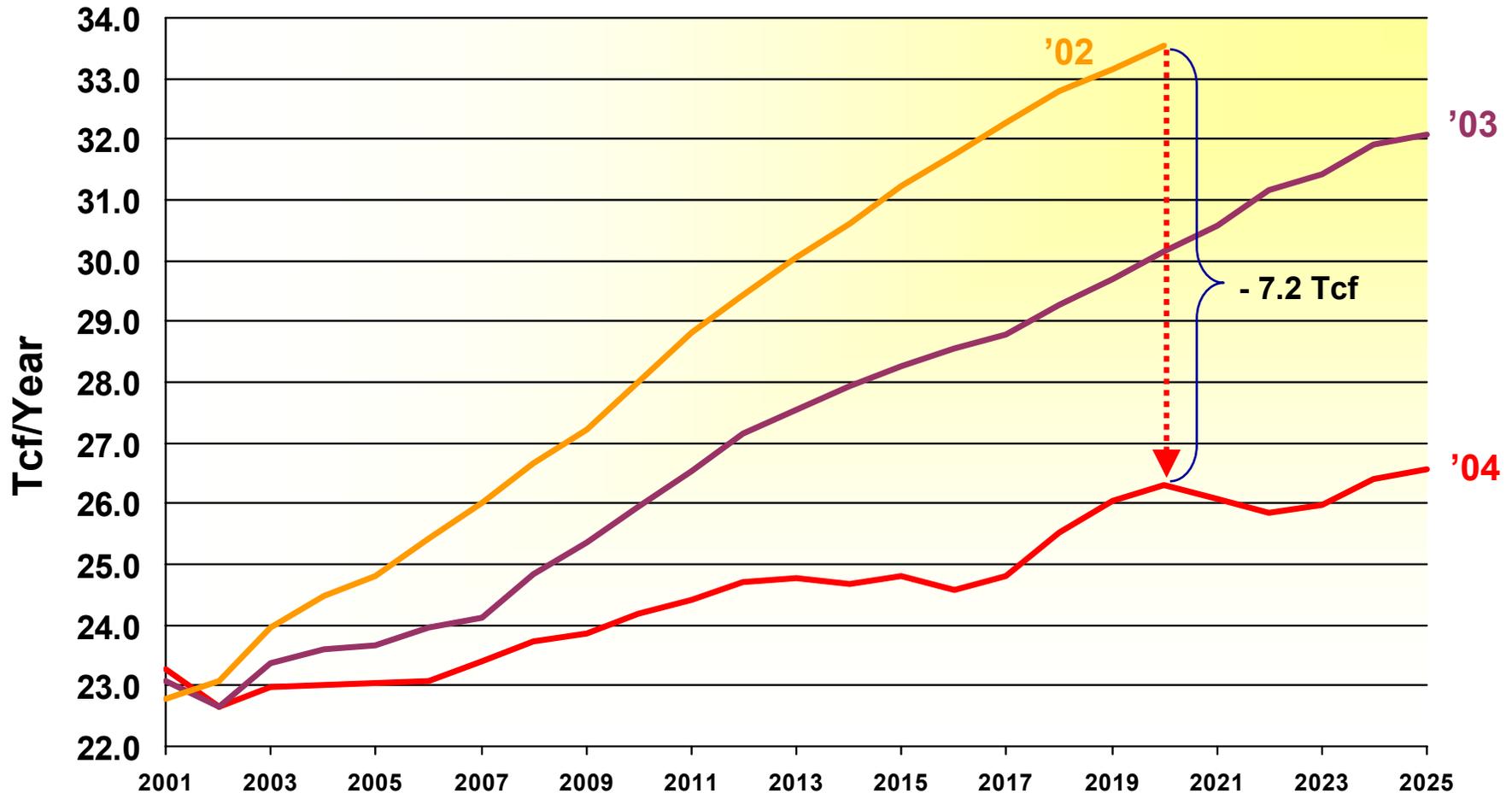
Reduced Canadian Import Forecast



AEO'04 Change Reflected National Petroleum Council's Estimate



Combined Decline in North American Supply Forecast to U.S.

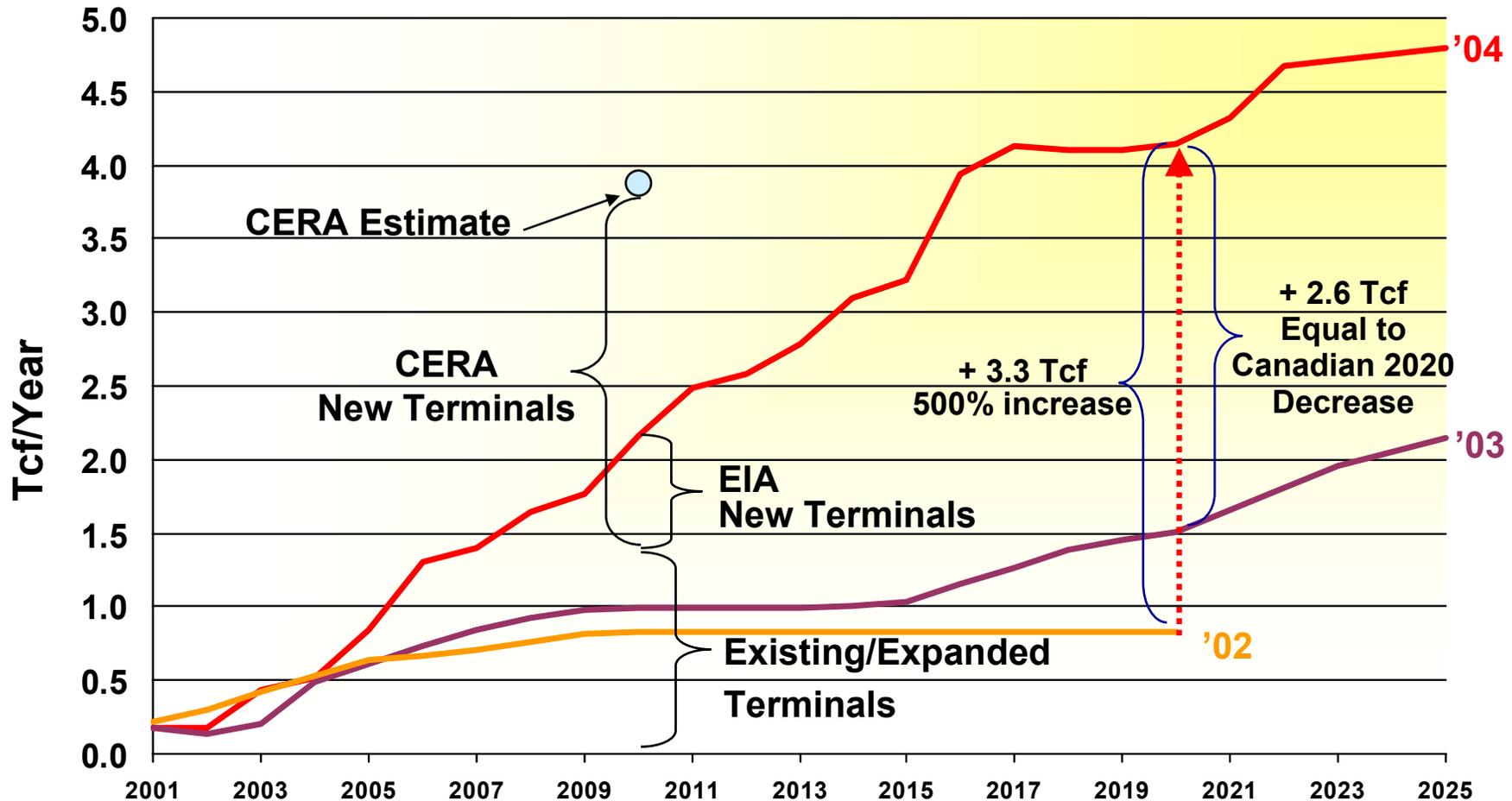


*Decrease in North American Supply (by 2020) Equal to - 7.2 Tcf
or 1/3 of Today's North American Supply to U.S.*



Changing LNG Import Forecasts

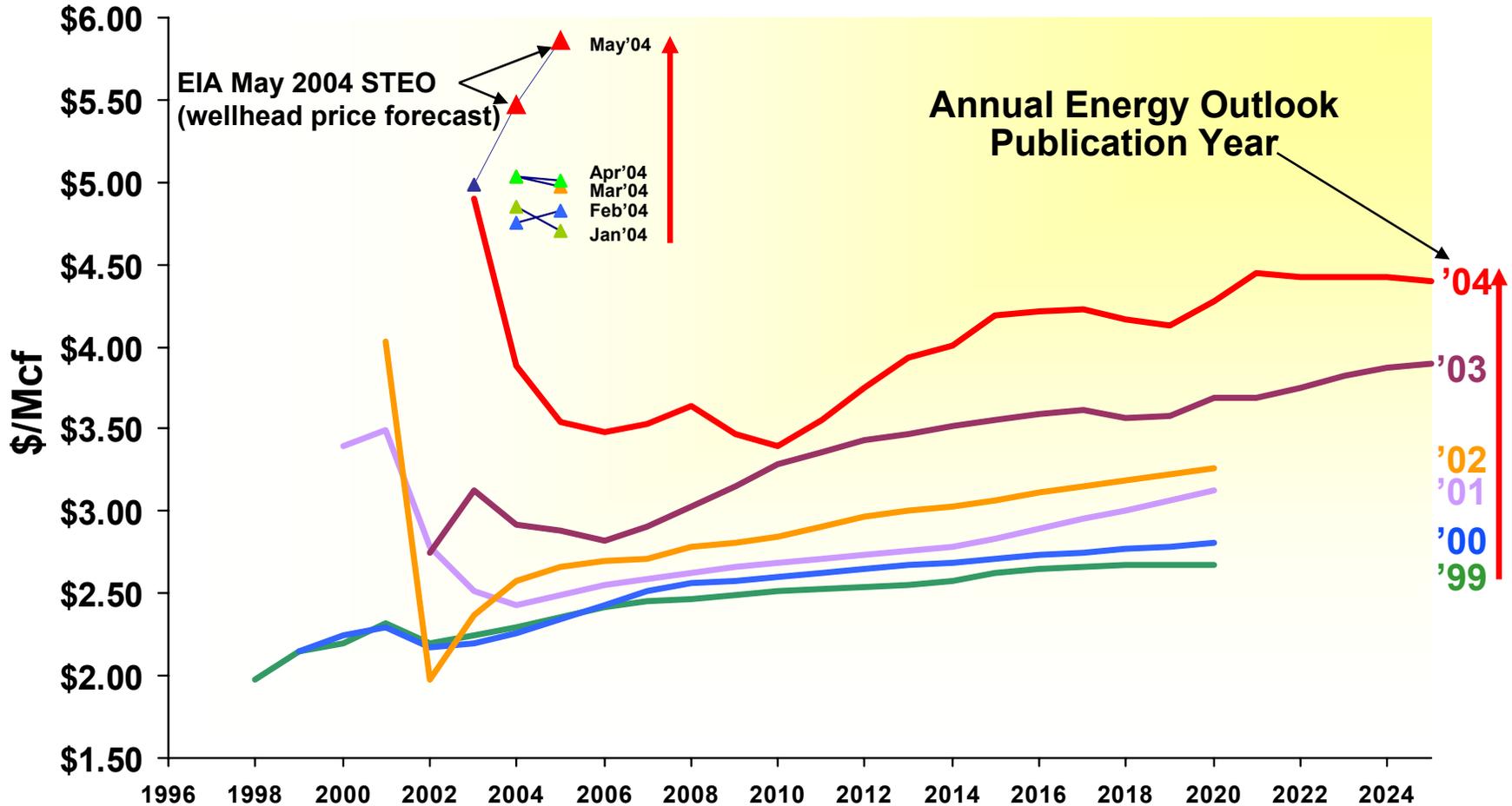
Shift in Imported Fuel for Gas-fired Generation



*Effective Introduction of Competitive LNG Market
Key to Natural Gas Price Moderation*



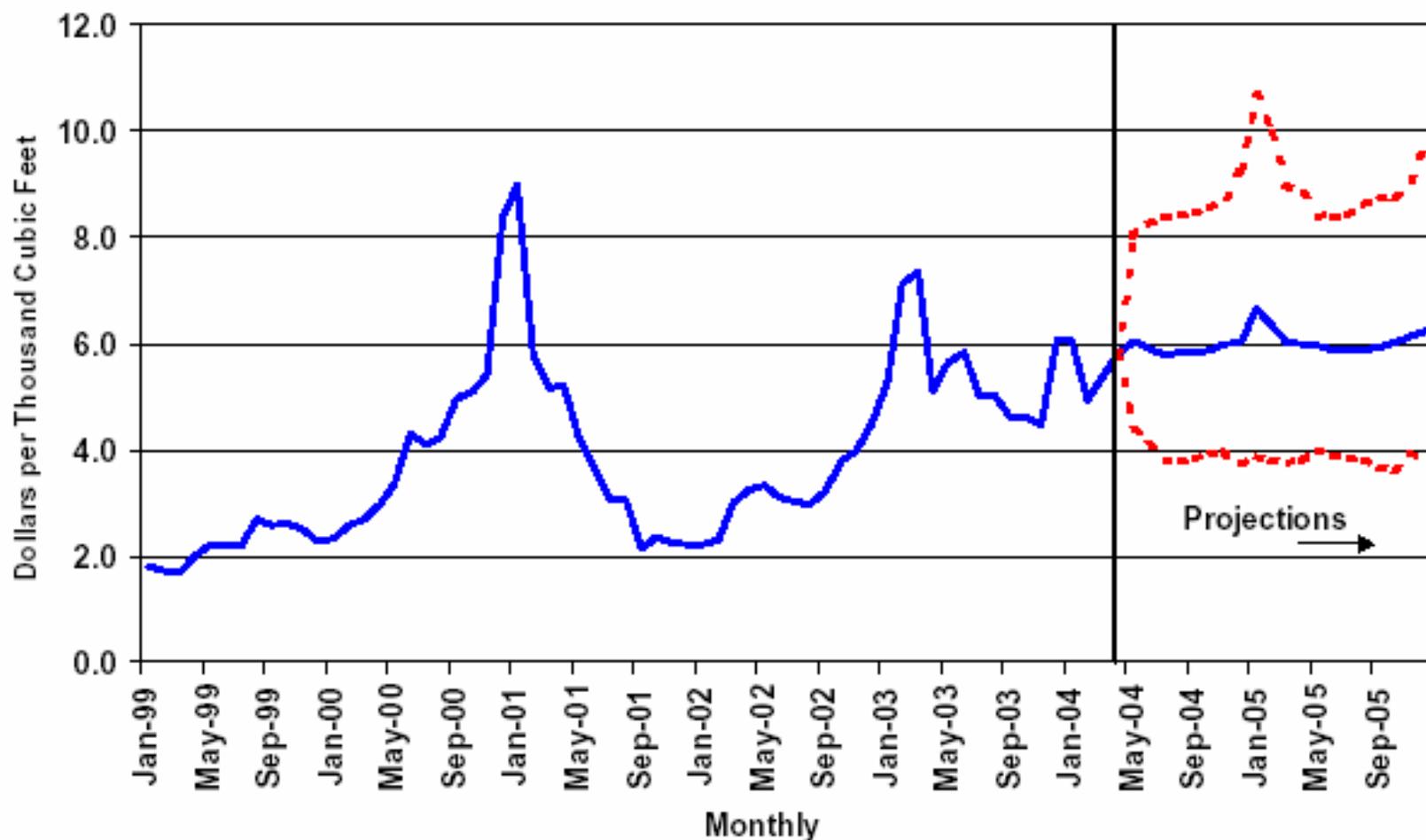
Increasing Natural Gas Price Forecasts



*Unrelenting Trend of Increasing Price Forecasts,
Mid-term Moderation in Price Tied to Success of LNG Market*



Figure 9. U.S. Natural Gas Spot Prices (Base Case and 95% Confidence Interval*)

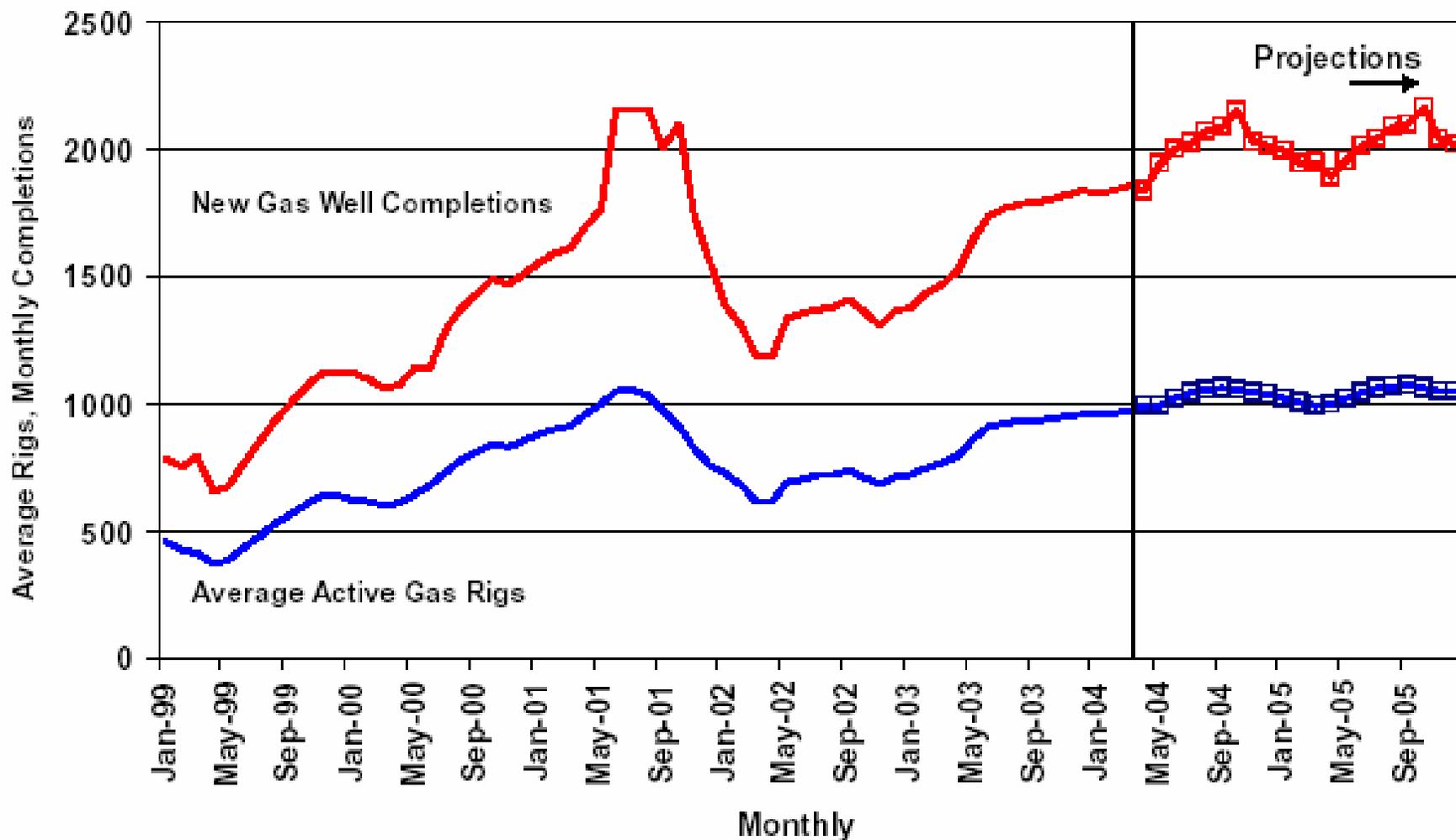


*The confidence intervals show ± 2 standard errors based on the properties of the model. The ranges do not include the effects of major supply disruptions.

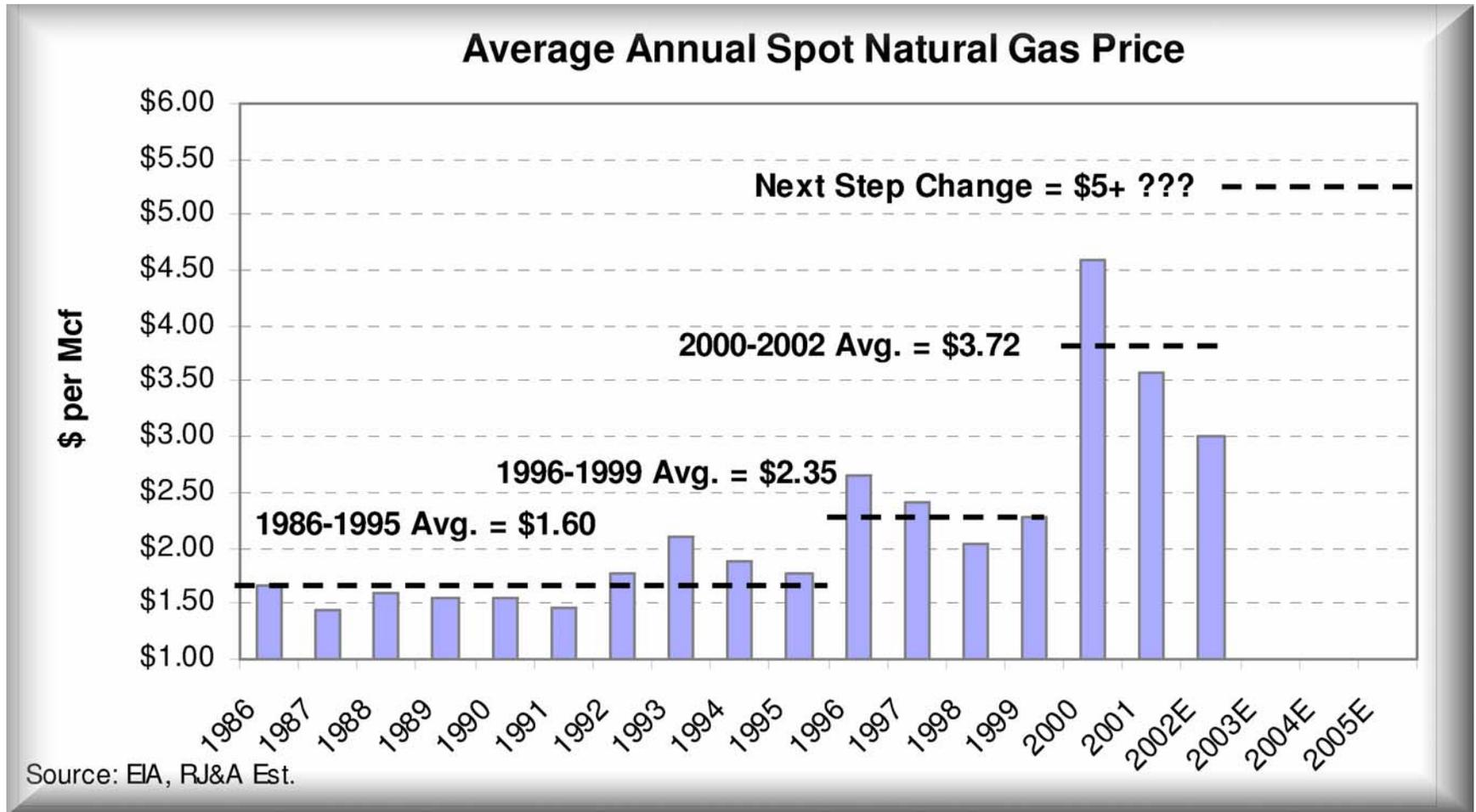
Sources: History: Natural Gas Week; Projections: Short-Term Energy Outlook, May 2004.



Figure 17. U.S. Natural Gas-Directed Drilling Activity



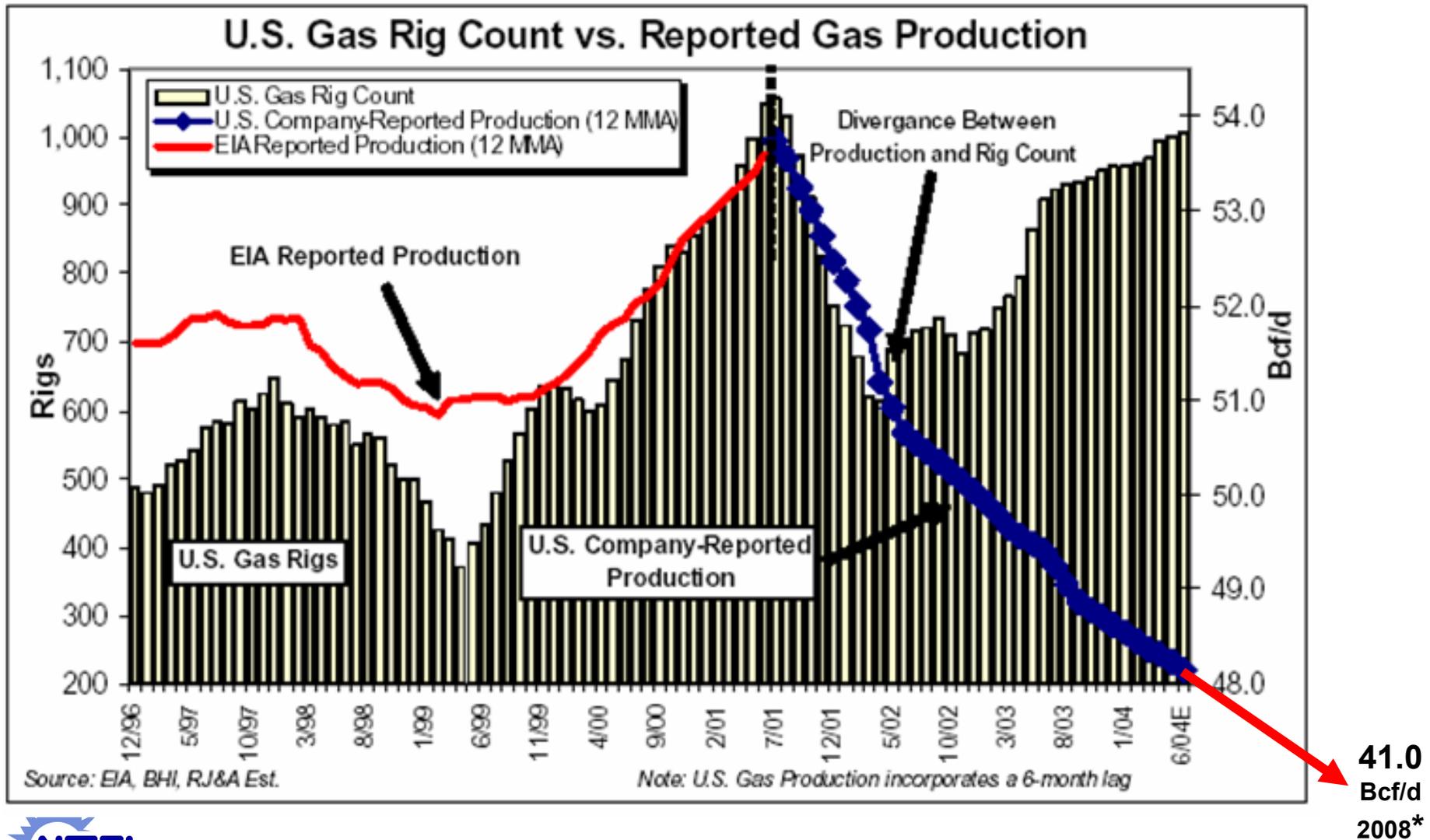
Step Changes In Domestic Natural Gas Prices



Raymond James Calls U.S. Natural Gas Price Step Change to \$5+ (9/02)



Production Declines Despite Near Record Drilling



Declining Domestic Natural Gas Production

Analysts	Companies Surveyed	Year-on -year Production Change Q1'04
Lehman Brothers	53	-5.3%
Southwest Securities	43	-5.2%
Jeffries & Co.	61	-4.9%
EIA May'04 STEO	-	0.0%



Domestic Near-term Natural Gas Price Forecasts

Analysts	Basis	Date	<u>2004</u>	<u>2005</u>
Lehman Brothers	Henry Hub	11-May	\$5.25	\$4.75
CERA	Henry Hub	16-Apr	\$5.48	\$6.02
Raymond James	Henry Hub	22-Mar	\$5.92	\$6.00
Merrill Lynch	Henry Hub	20-Apr	\$5.25	\$4.75
EIA	Composite Hubs	11-May	\$5.79	\$6.07
Avg.			\$5.54	\$5.52



Summary

- **Natural gas price forecasts have seen an unrelenting climb over the last 5 years**
- **Near-term prices will remain high due to production declines, high electricity demand and few alternatives**
- **Effective introduction of LNG on a competitive basis promises price moderation by end of decade**
- **Difficult/delayed LNG industry development or inefficient LNG market signify prolonged problems for price competitiveness of natural gas**

