

Joint IEPR and Electricity & Natural Gas Committee Workshop

Natural Gas Price Forecast and Uncertainty

June 16, 2009

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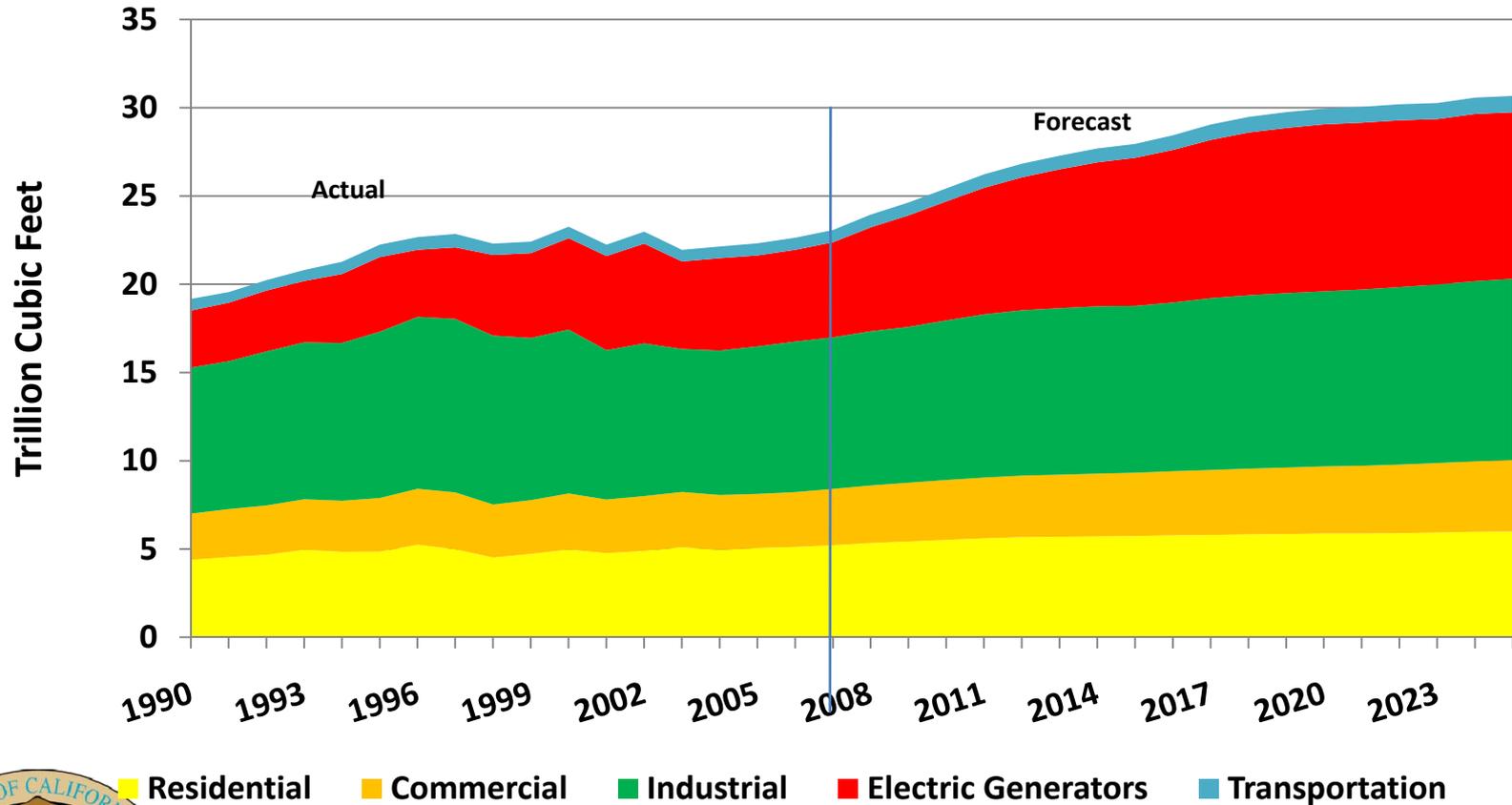


Natural Gas Historical Changes-- Last 20 Years

- Early 90's natural gas supply increased due to strong production from WCSB—price of gas ~ \$2/Mcf
- Gas demand for power generation increased -- price of gas increased ~\$4/Mcf by 2000's
- Domestic (US) natural gas production peaked in 2001 ~ 52 Bcf/d
- Gas demand (US) increased through 2000's up to 60 Bcf/d ~price of gas up \$5 and \$7/Mcf



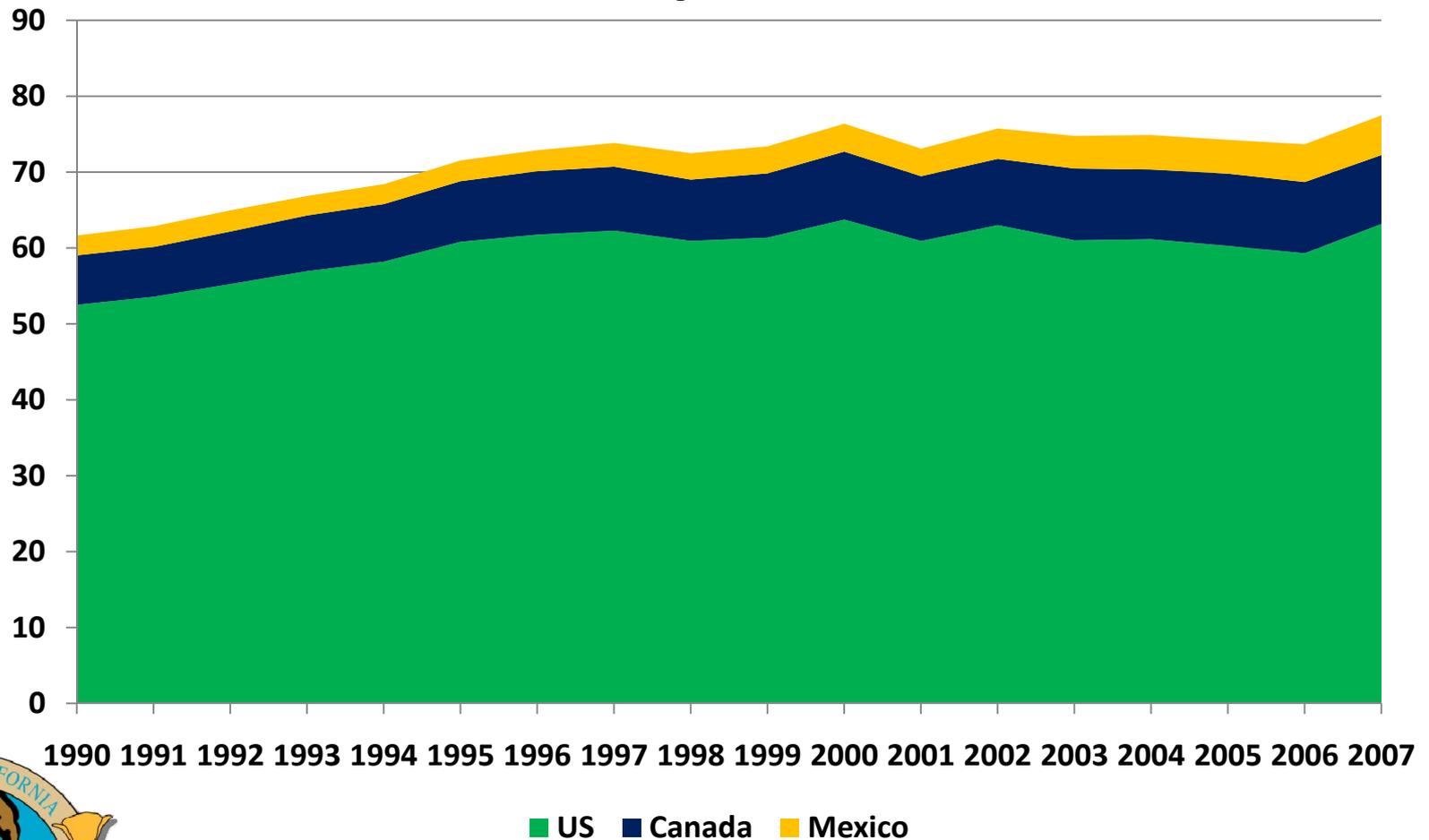
United States Natural Gas Demand by Sector



Source: Energy Information Administration



North America Natural Gas Demand Bcf/d



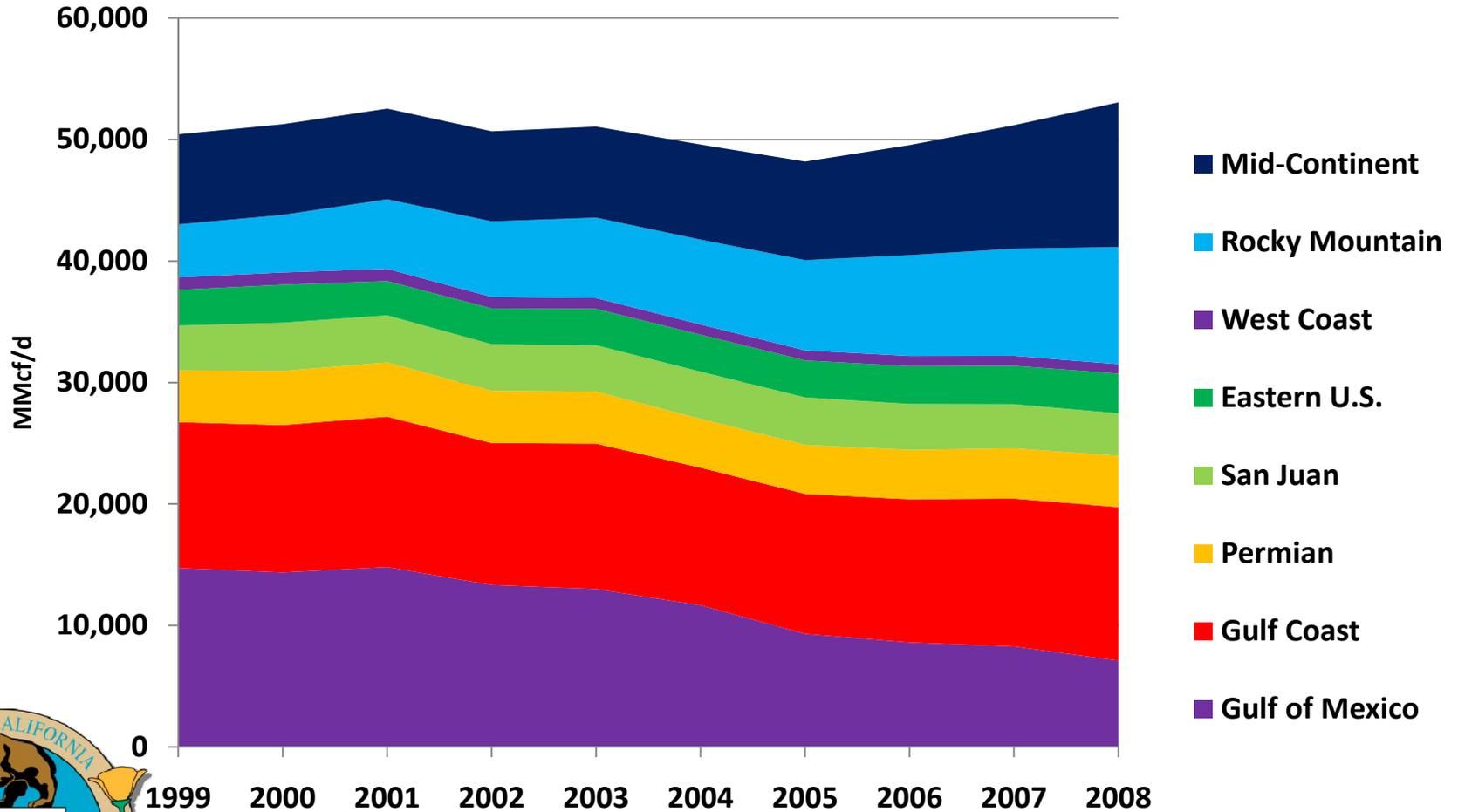
1990 1991 1992 1993 1994 1995 1996 1997 1998 1999 2000 2001 2002 2003 2004 2005 2006 2007

■ US ■ Canada ■ Mexico

Source: BP Statistical Review of World Energy June 2008



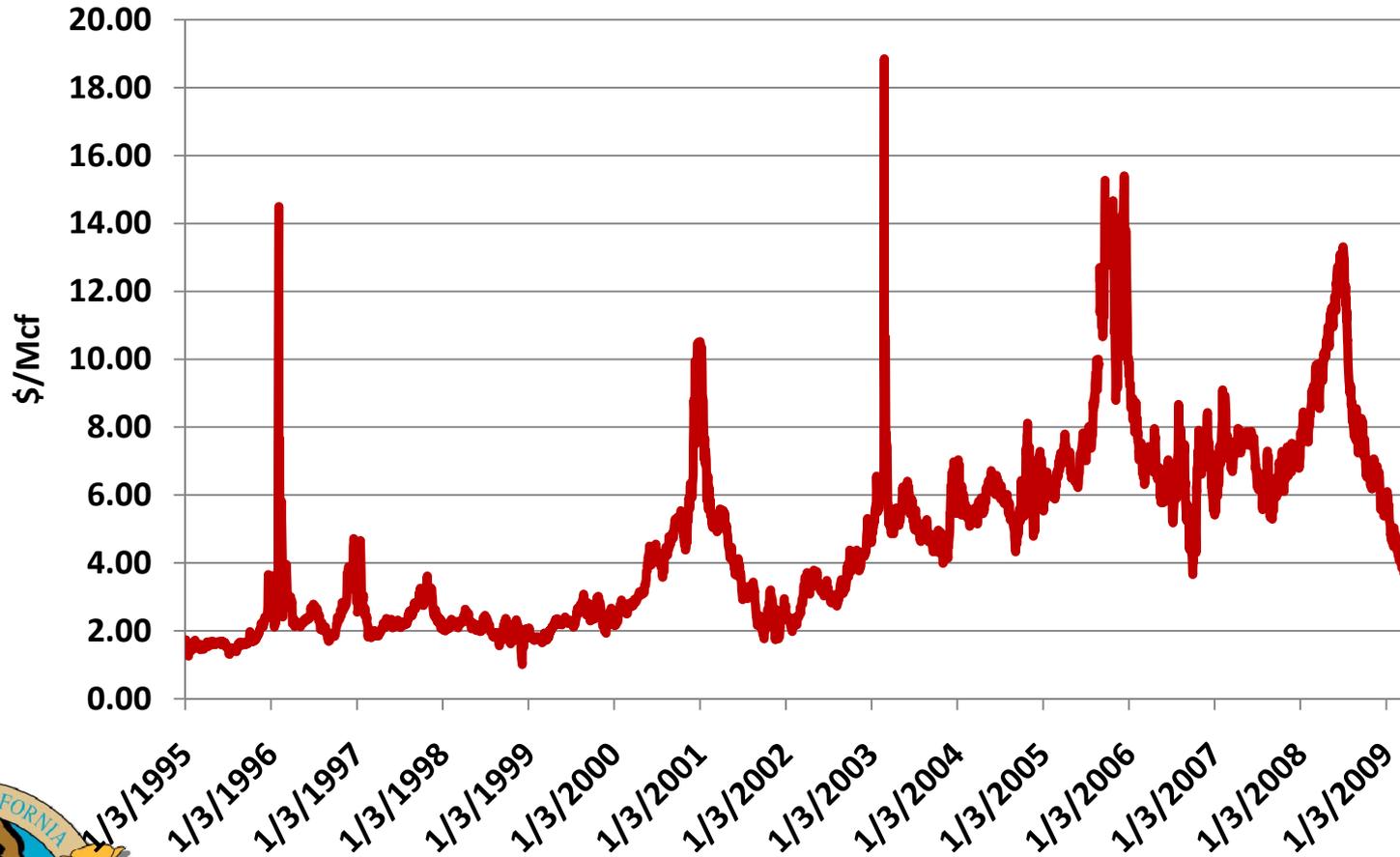
United States Natural Gas Production by Region



Source: Lippman Consulting, Inc.



Henry Hub Natural Gas Price (\$/Mcf)



Source: Natural Gas Intelligence



California's Resources Code Directives

California Public Resources Code (PRC) Section 25301 (a) directs the Commission to:

“At least every two years, the commission shall conduct assessments and forecasts of all aspects of energy industry supply, production, transportation, delivery and distribution, demand, and prices.”



California's Resources Code Directives, cont.

In addition Section 25303 (7) of the PRC points out the need for:

“Identification of impending or potential problems or uncertainties in the electricity and natural gas markets, potential options and solutions, and recommendations.”



Gas Prices are Important Because...

- California consumes 6.3 Bcf/d ~2.3 Tcf/yr
- California imports 87 percent of its needs from out state .. and state production is decreasing
- During the energy crisis of 2000-2001 California spent ~\$19 billion/year on natural gas or ~\$8.4/Mcf—almost double from previous years
- More than 40 percent (2.8 Bcf/d) is consumed by the power sector—impacts electricity rates



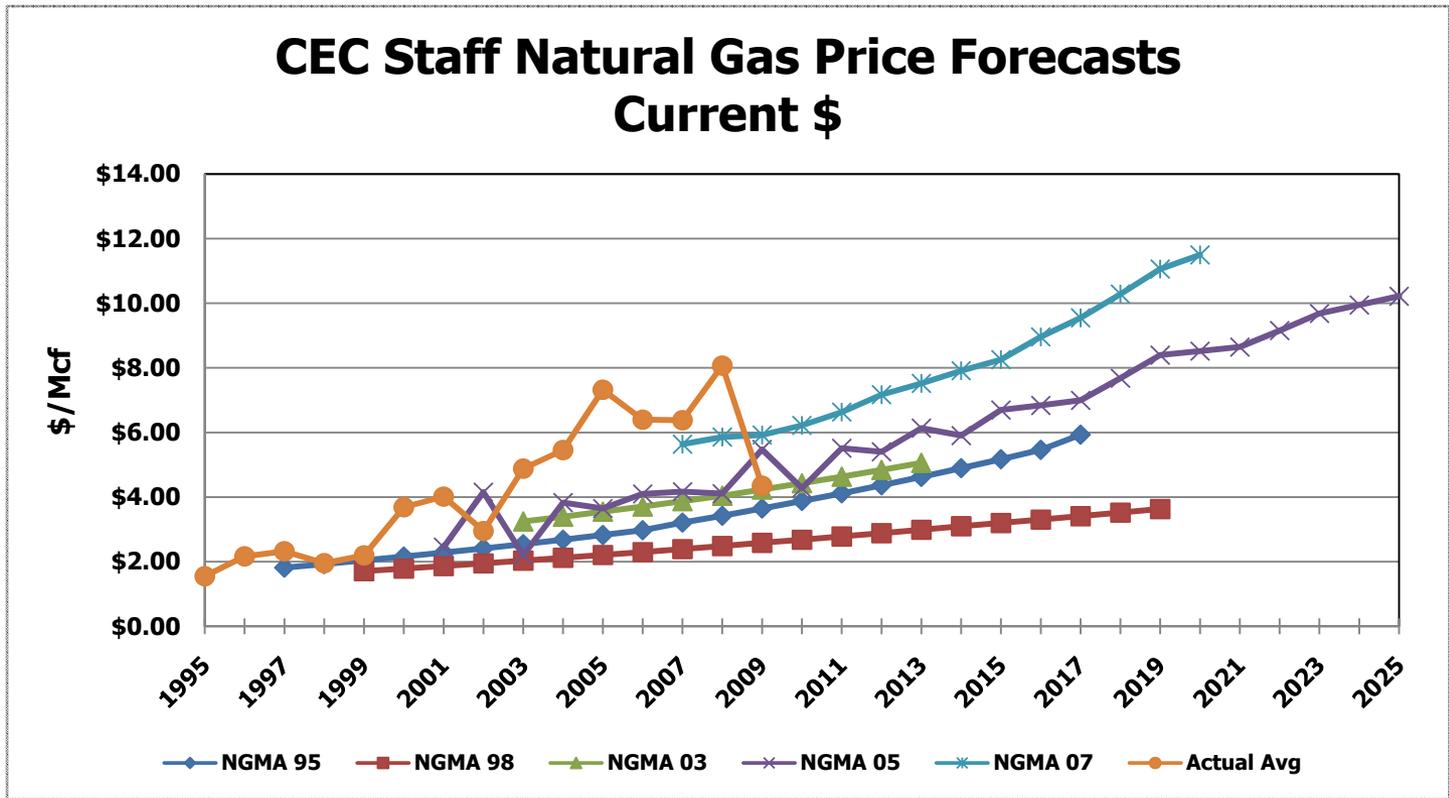
Role of Natural Gas Price Forecast

Natural gas price forecast is used to:

- Estimate future power prices
- Develop the Market Price Referent (MPR) by the CPUC
- Evaluate renewable energy projects
- Financial institutions to lend \$\$\$ for energy projects
- Develop energy budgets for institutions
- Others



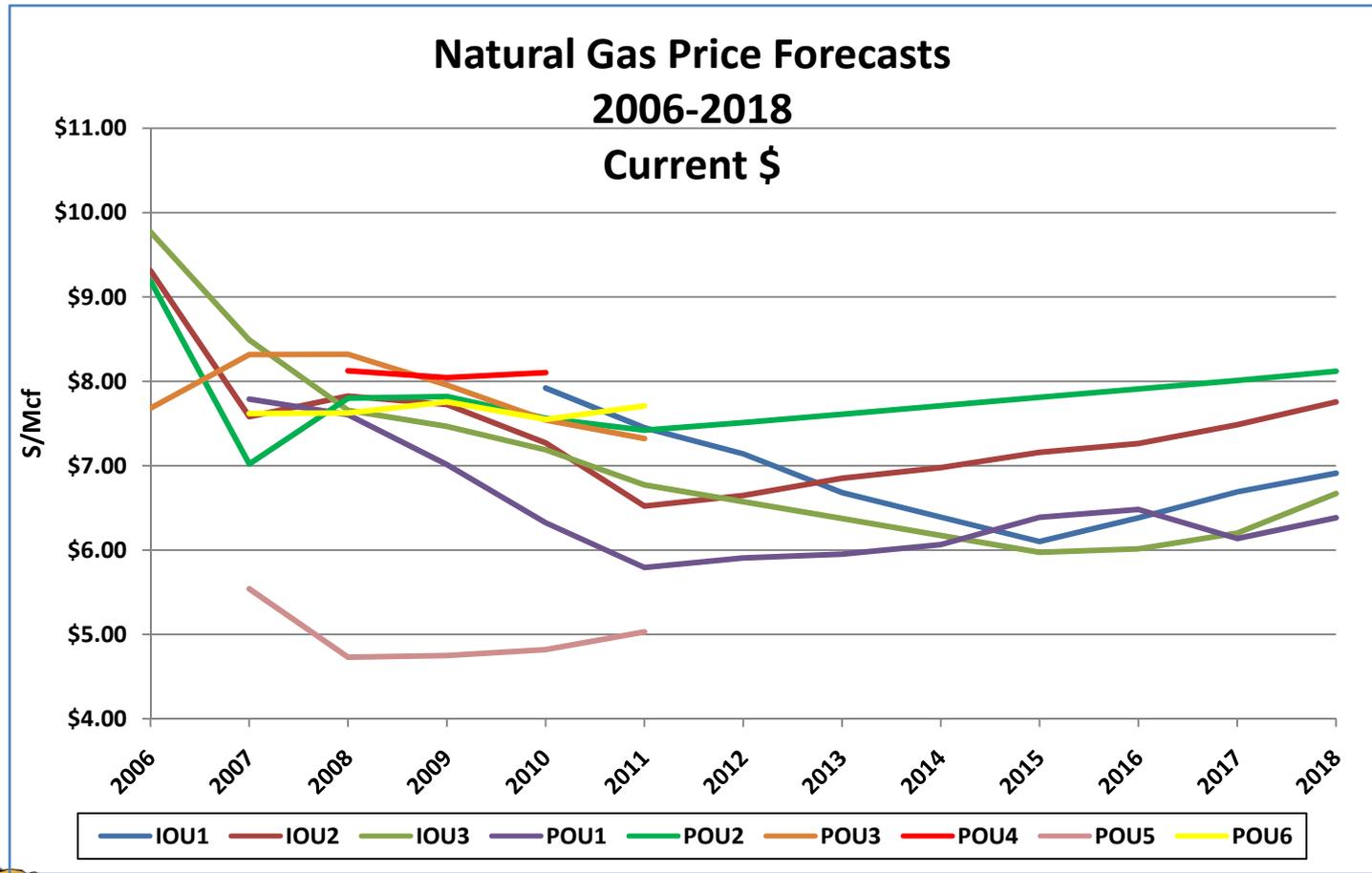
CEC staff's Natural Gas Market Forecasts



Source: CEC staff Natural Gas Market Assessment Reports



California Utilities Natural Gas Price Forecasts



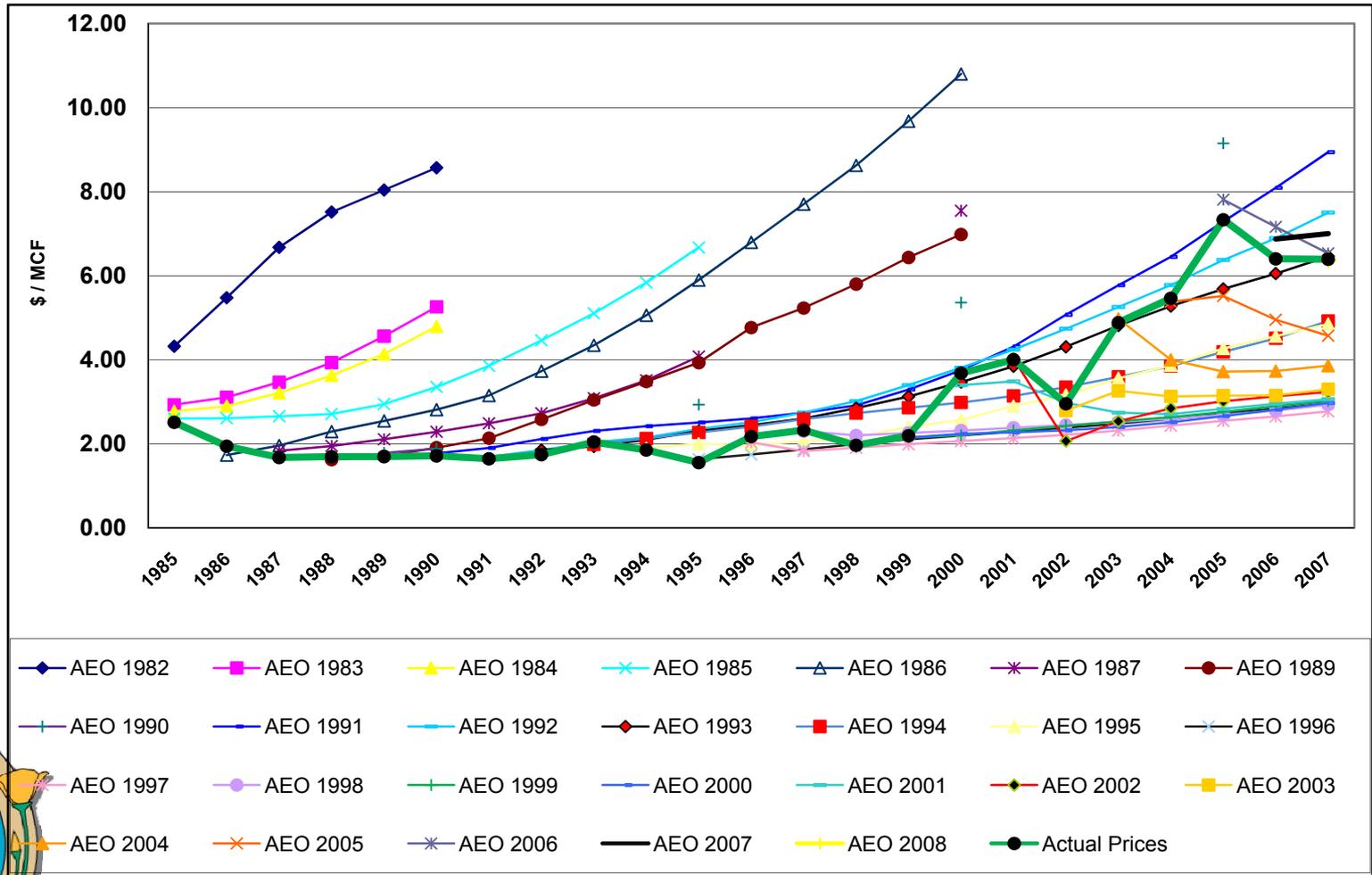
Source: California Utilities submittals under confidentiality during the 2005 IEPR proceeding



EIA Wellhead Price Forecast Comparison: AEO

1982 – 2008

Current \$



How To Move Forward

- Point forecasts are wrong
- Impossible to account for all variables that influence natural gas prices
- Importance of some variables changes over time
- Can we take into account the uncertainty elements of inputs and outputs in modeling?
- How can we make forecasts useful?



Questions and Comments

