

# **Cook Inlet Natural Gas Demand**

Presentation to

## **South Central Alaska Energy Forum**

**William Nebesky**

**Division of Oil and Gas**

September 20, 2006

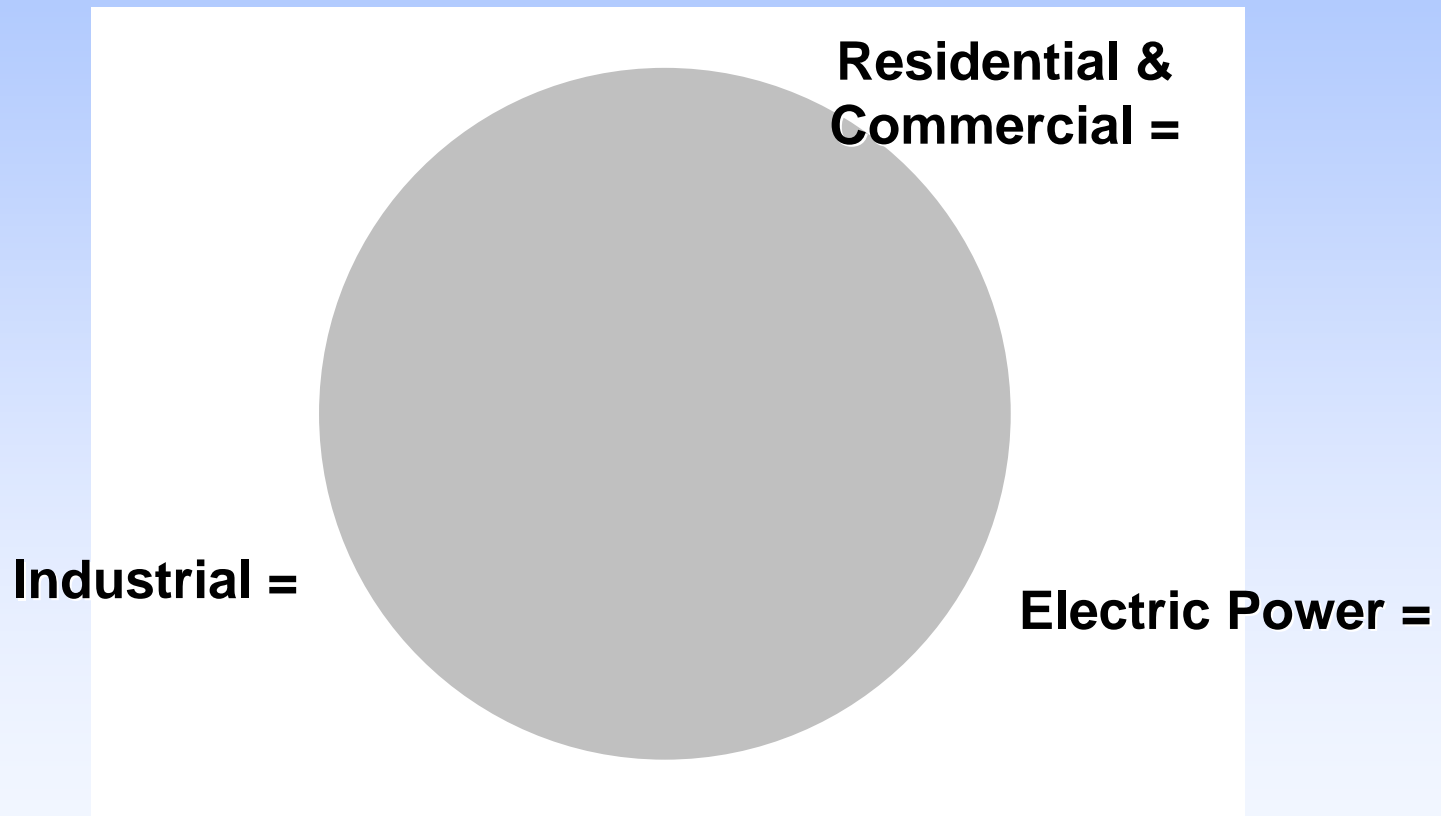


Alaska Department of  
**Natural  
Resources**

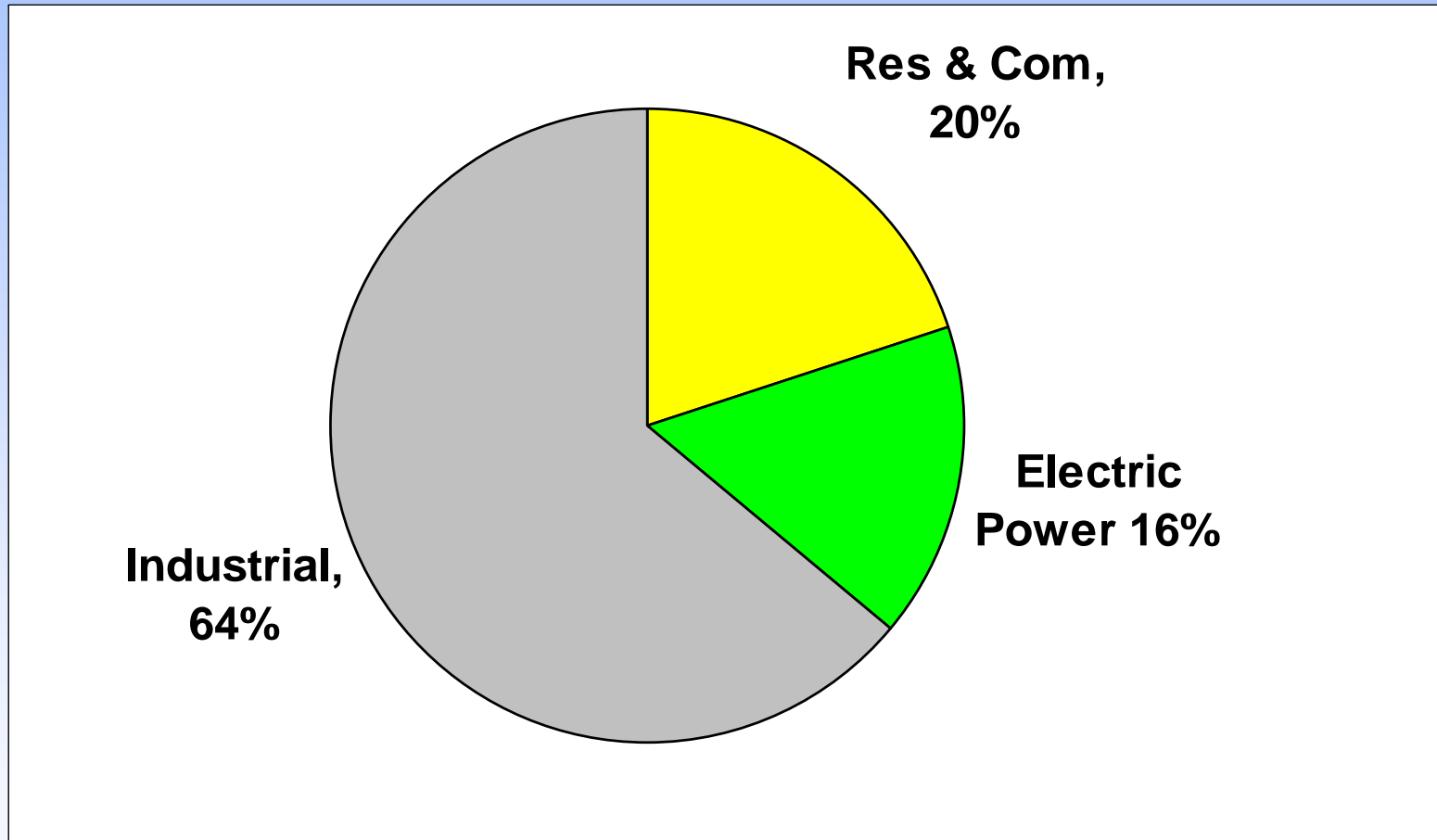
# Major Points Covered In Presentation

- A. Structure of Demand
- B. Determinants of Demand
- C. Outlook and Policy Implications

# Total Gas Consumption in 2005 = 207 Billion Cubic Feet (Bcf)



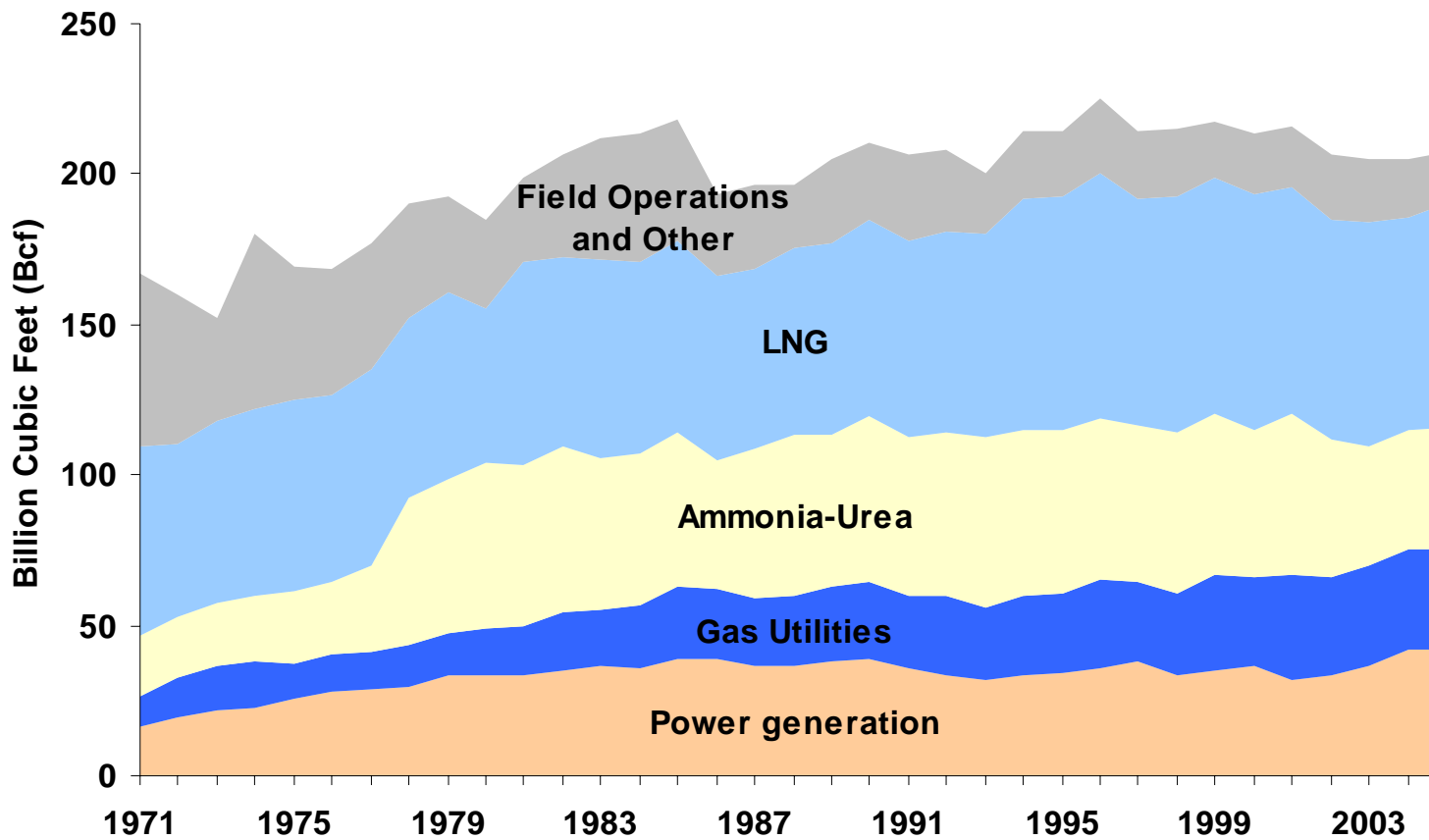
# Total Gas Consumption in 2005 = 207 Billion Cubic Feet (Bcf)



# Annual Average Natural Gas Consumption by Major Group

		2005		1996-2005	
		<u>(Bcf / Yr)</u>	<u>(%)</u>	<u>(Bcf / Yr)</u>	<u>(%)</u>
Res & Com		33.3	20%	36.4	17%
Electric		41.8	16%	31.1	15%
Industrial		132.3	64%	145.1	68%
	LNG	74.9	36%	76.0	36%
	Fertilizer	40.4	20%	48.3	23%
	Field Ops	17.1	8%	20.8	10%
<b>Total</b>		<b>207.4</b>	<b>100%</b>	<b>212.6</b>	<b>100%</b>

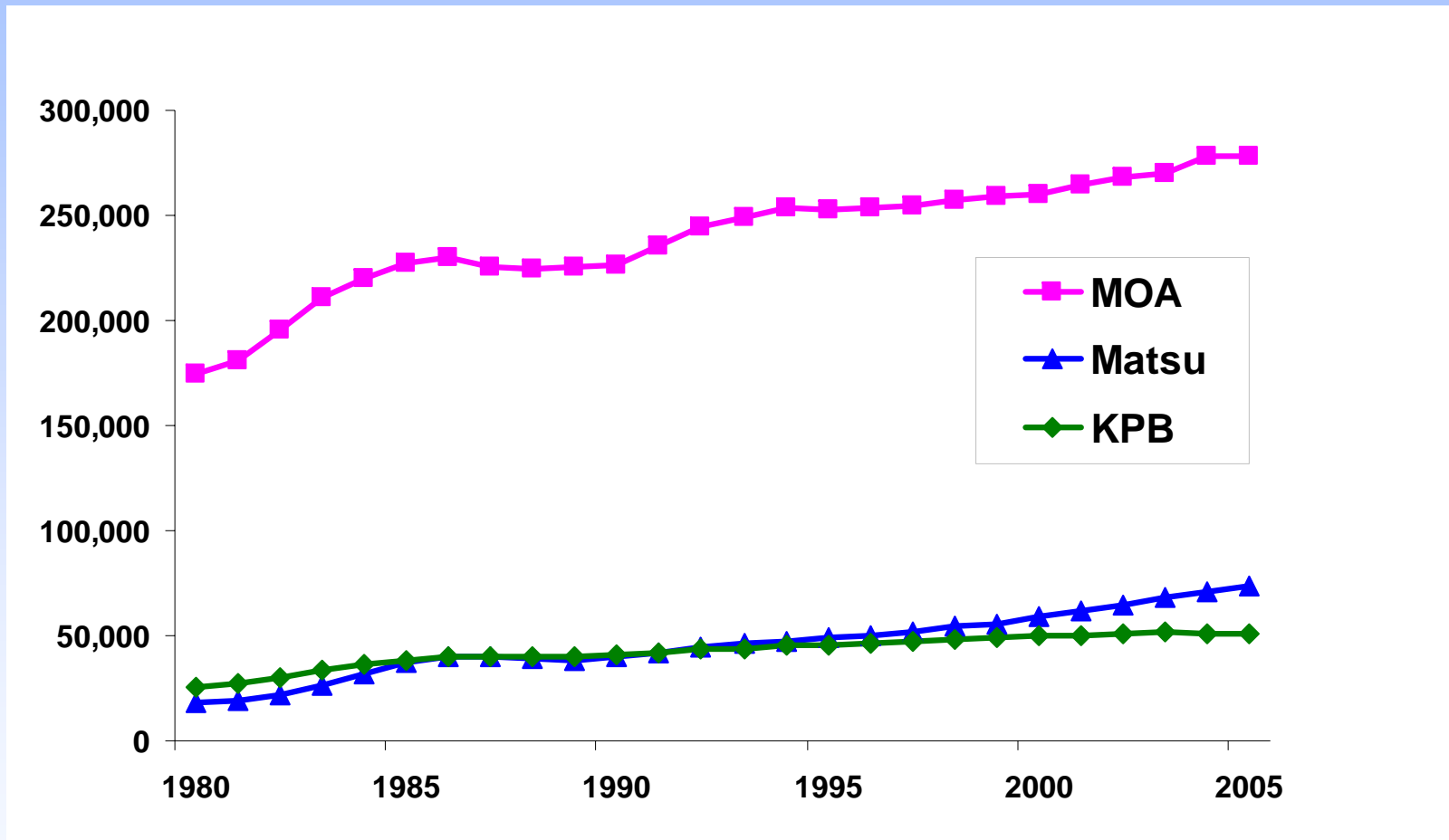
# Annual Average Natural Gas Consumption by Major Group 1971 - 2005



# Residential & Commercial

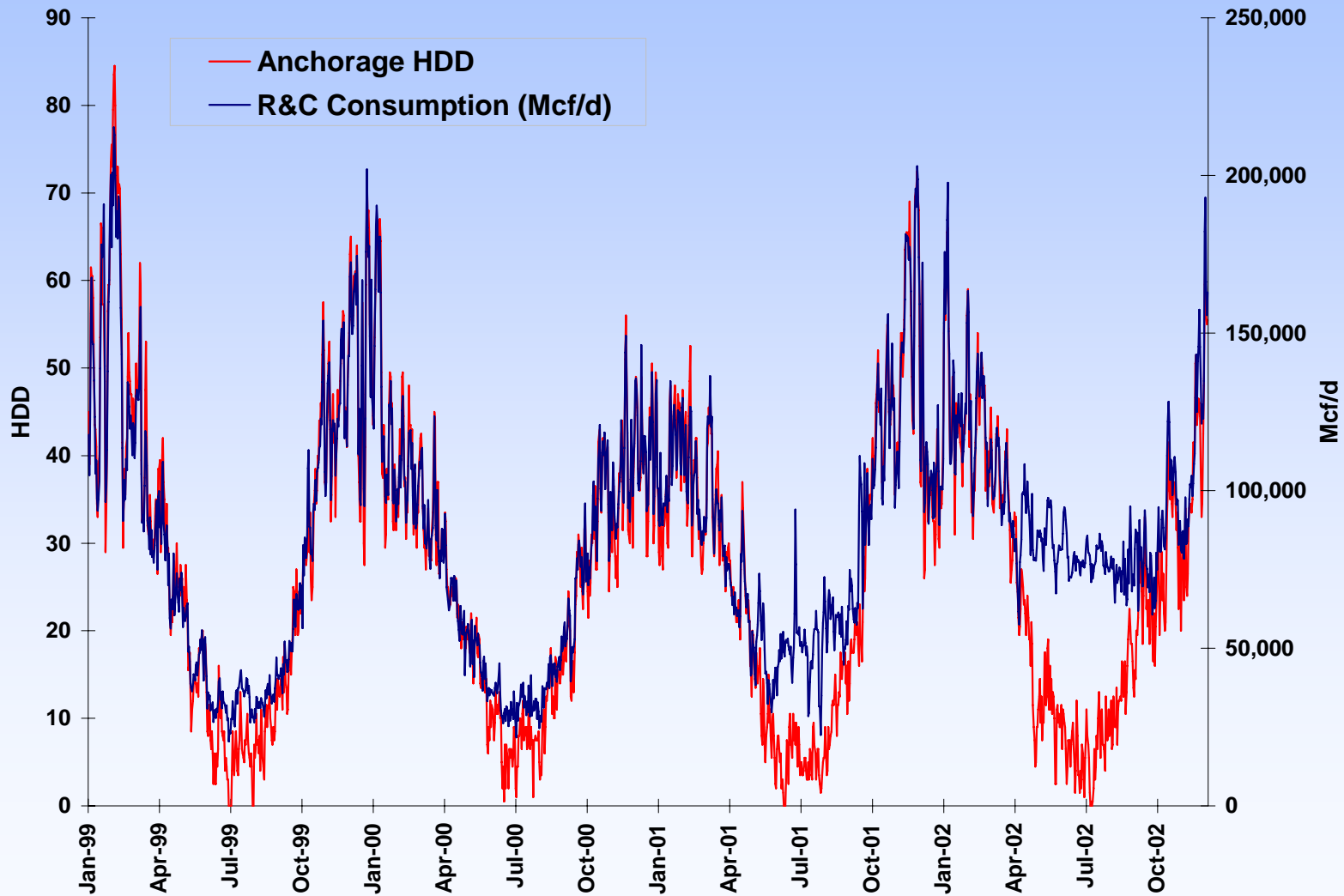
- Growth driven by South Central Economy
  - South Central Pop Growth 1980-05 = 2.5%
  - Expect R&C >1.2% per year through 2018
  - Housing Stock
- Dependent upon Natural Gas
  - Historically inexpensive
  - Clean, efficient fuel
- Fuel Oil
  - Former fuel of choice
  - \$18.77 Mm Btu Equivalence
- Seasonality and Deliverability
- Price Sensitivity

# South Central Population, 1980-2005



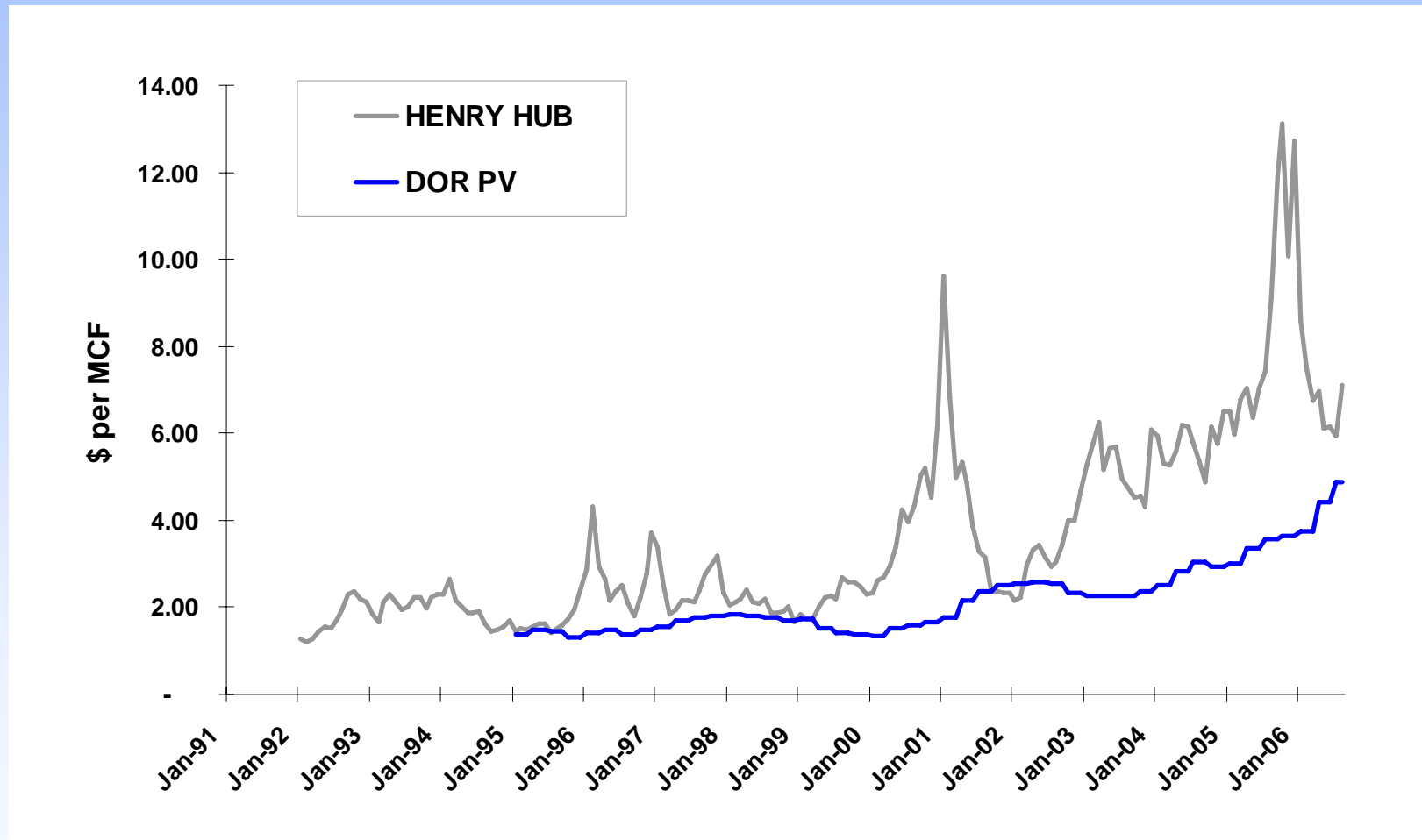


# Residential and Commercial Seasonal Gas Consumption 1999-2002



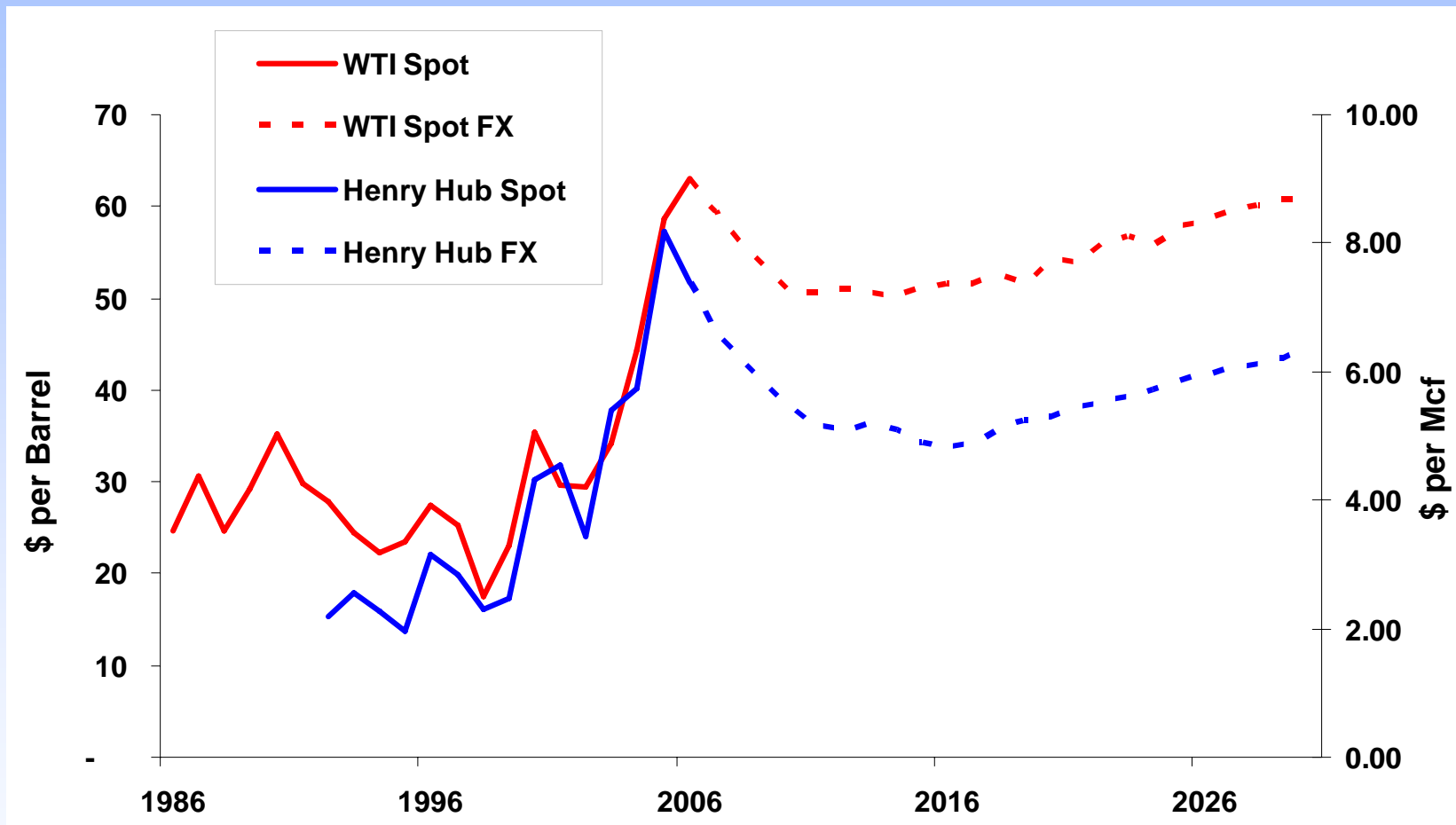
Source: Lukens Energy Group (for DNR), 2004.

# Henry Hub Spot & DOR Prevailing Value Jan 1991 – Aug 2006



# Forecast of WTI and Henry Hub

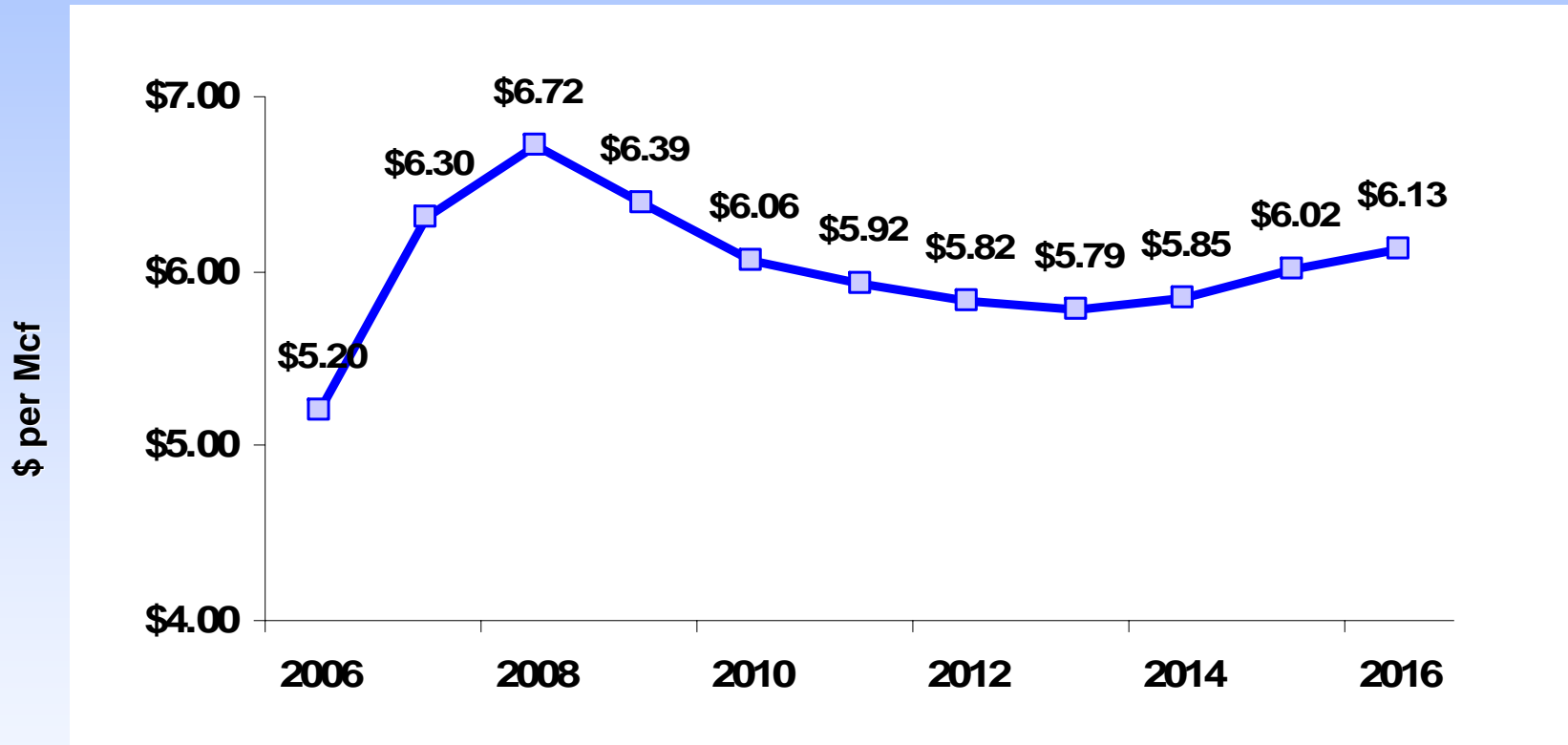
\$2006 per Barrel and \$2006 per Mcf



Source: *Annual Energy Outlook 2006*, Energy Information Administration, U.S. DOE. Based on Imported Low Sulfur Light Crude Oil Price and Average U.S. Wellhead Natural Gas Price.

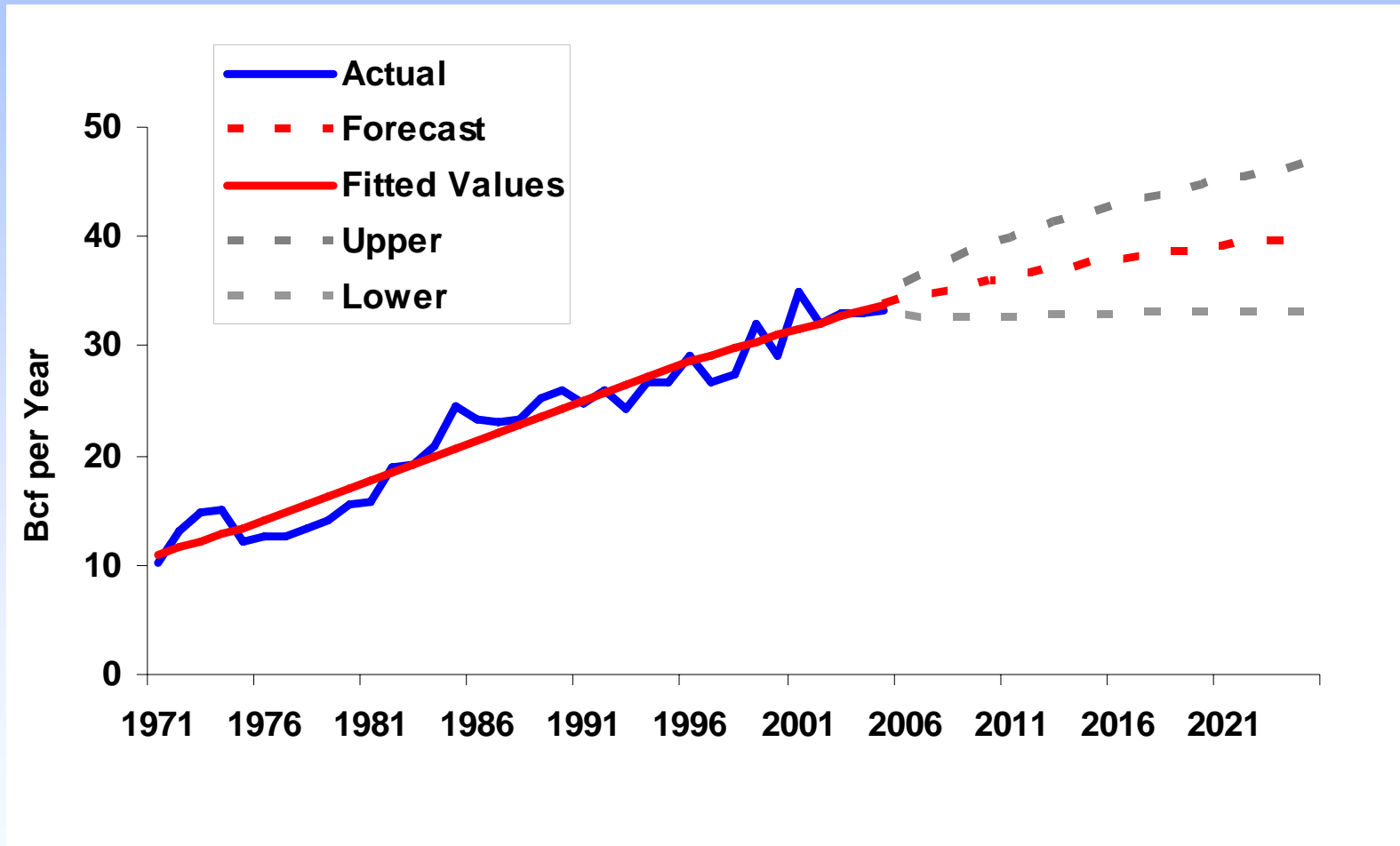
# Weighted Cost of Gas Outlook

(\$ per Mcf, Nominal)



Estimates based on DOE oil and gas price forecasts and ENSTAR gas supply contract terms.

# Price Sensitivity Residential & Commercial

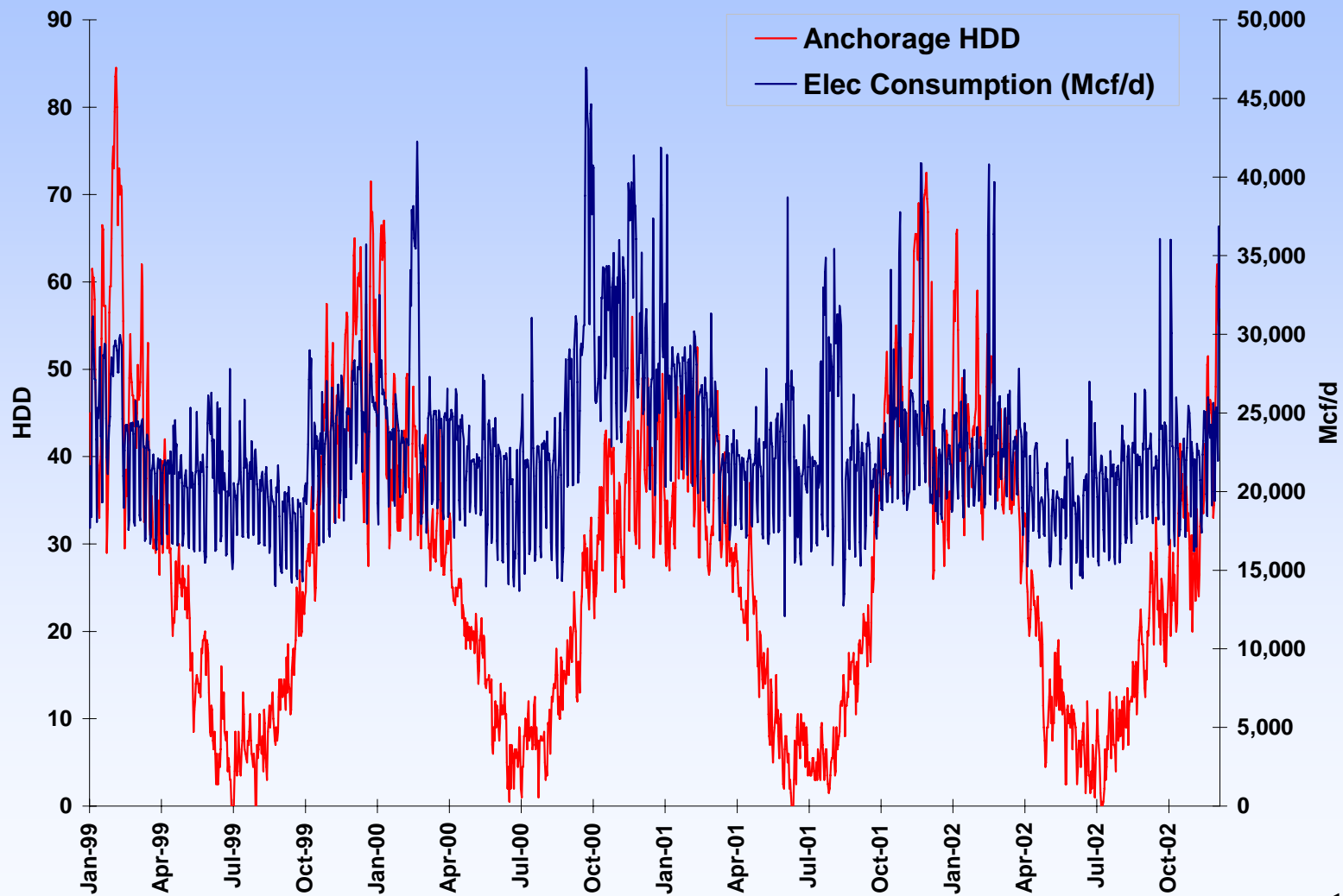


Upper and Lower Bounds based on 80% Confidence Interval.

# Gas-Fired Electric Generation

- CEA and MLP: 25 Plants, 1,008 MW
  - Capacity = 115 Mmcf/d, 42 Bcf/y (16% of CIB)
  - Infrastructure almost entirely gas based
  - Some hydroelectric capacity
- Long term gas supply
  - CEA gas supply contracts ~2010+
  - MLP equity gas ~2010+
  - Generator replacement

# GFEF Seasonal Gas Consumption 1999-2002



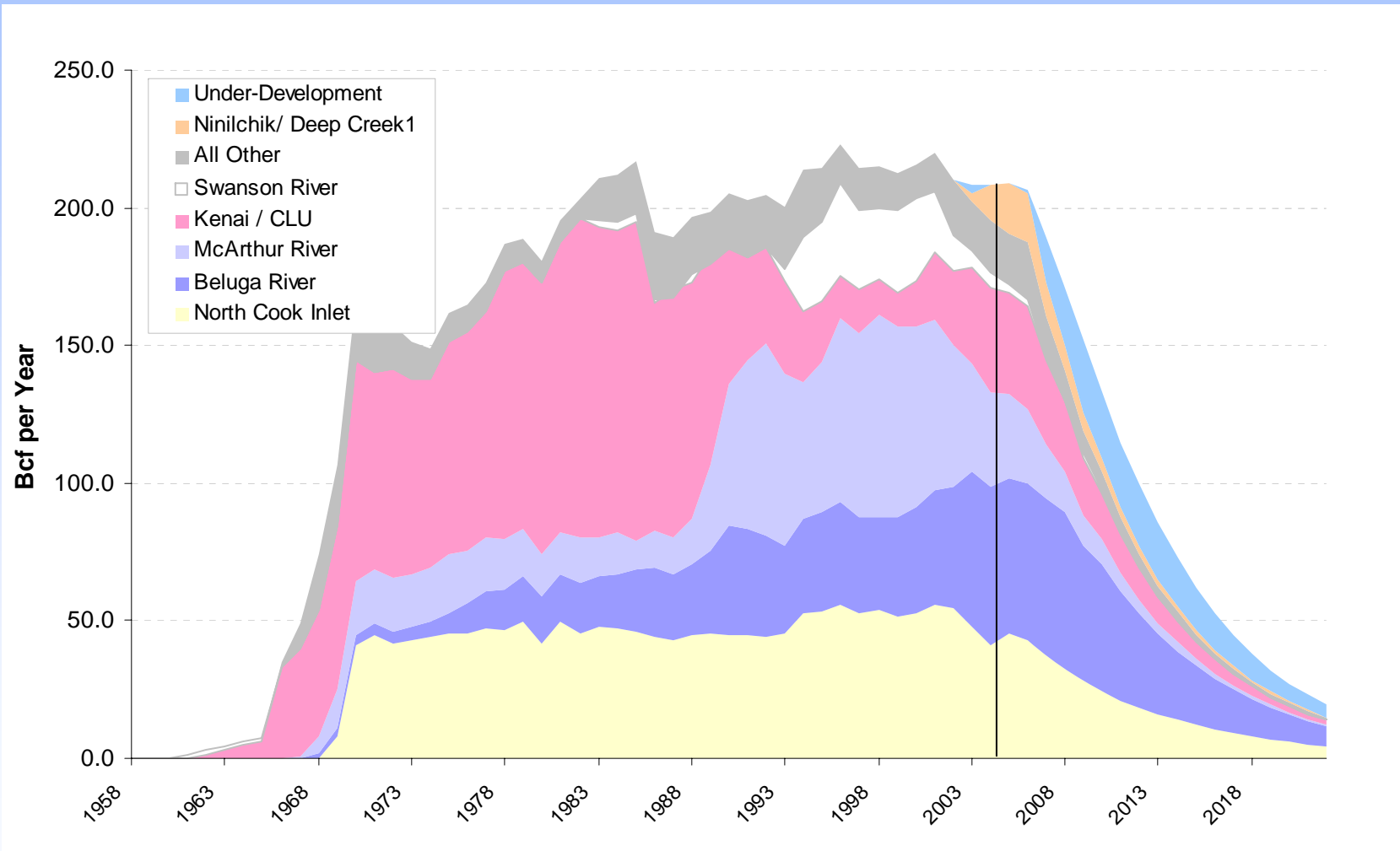
Source: Lukens Energy Group (for DNR), 2004.

# Industrial Demand

- Two-thirds of Consumption Pie
- Driven by Export Markets
- Depend on cheap, base-load gas supply
- Constrained by Supply/ Price
- Reserves to Production (R/P) Ratio in CIB
  - **1980**            **24**
  - **1990**            **18**
  - **2000**            **12**
  - **2006**            **8**



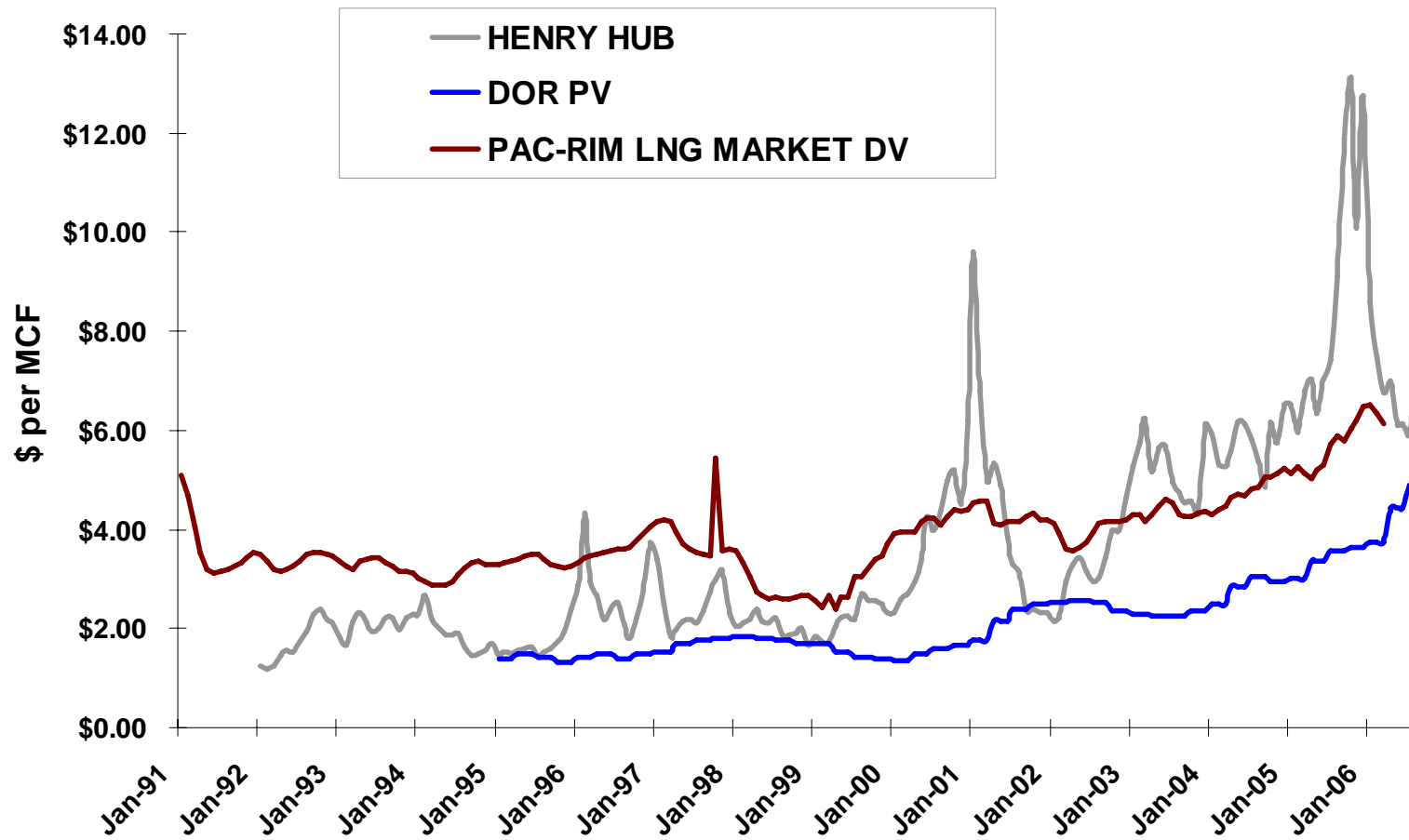
# Cook Inlet Historic and Forecast Gas Production, 1958 - 2025



# Nikiski LNG Plant

- Market – Japan Utilities
- Capacity = 220 Mmcf/d, 80 Bcf/y (36% of CIB)
- Export License Extension?
  - Decision depends on reservoir and demand studies currently underway
  - Such action is likely to be controversial
- Destination Value

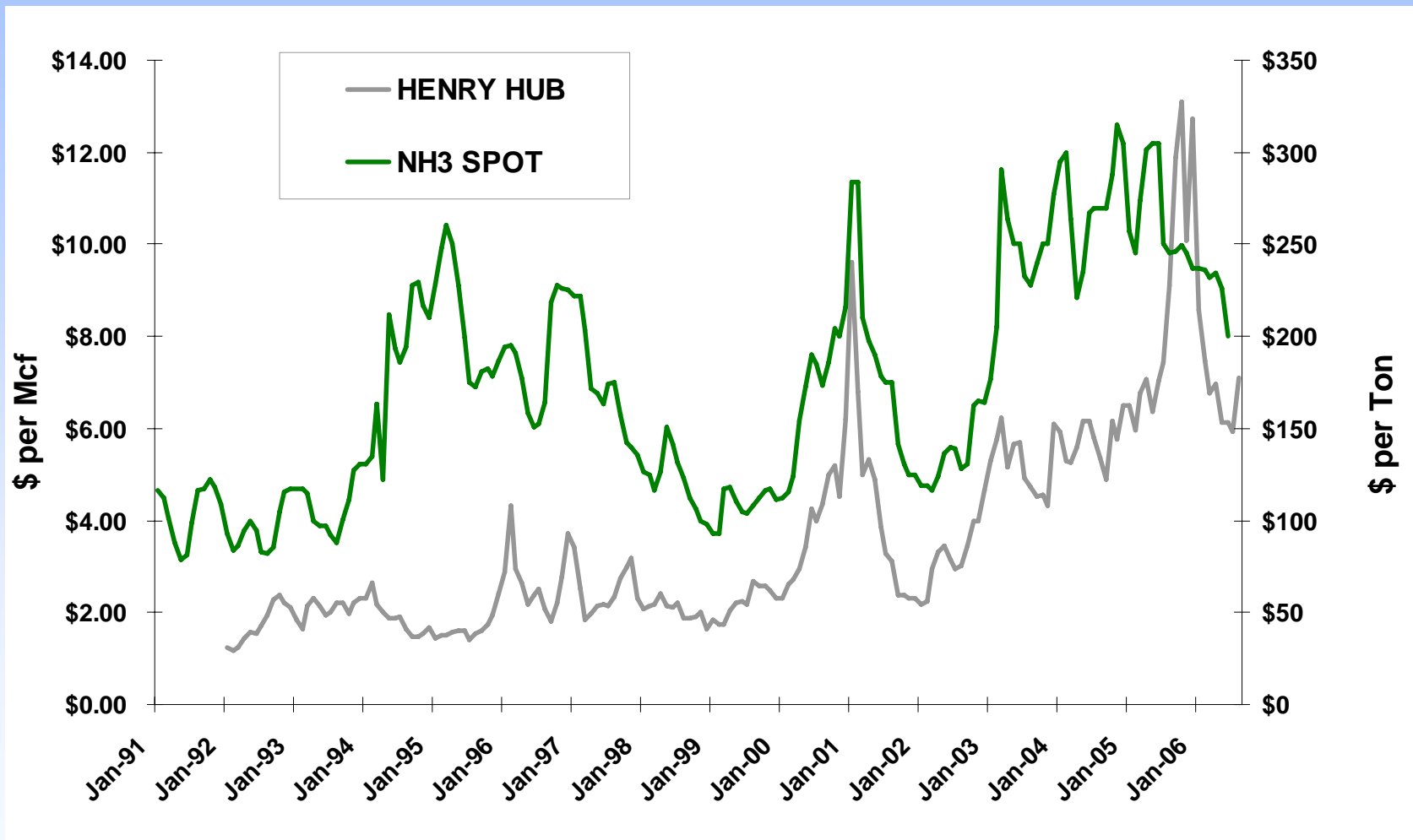
# Pac Rim LNG Destination Value



# Nikiski Fertilizer Plant

- Gas supply contracts through October 2007
- Plant expected to operate at 75% capacity
- Plant curtailment in Jan 06
  - Problem of seasonal peak demand
    - Total usage outstripped system deliverability
    - Frequency & duration likely to increase in future
  - Agrium anticipated the problem; no lay-offs
  - Gas storage helped combat problem
- Product Prices

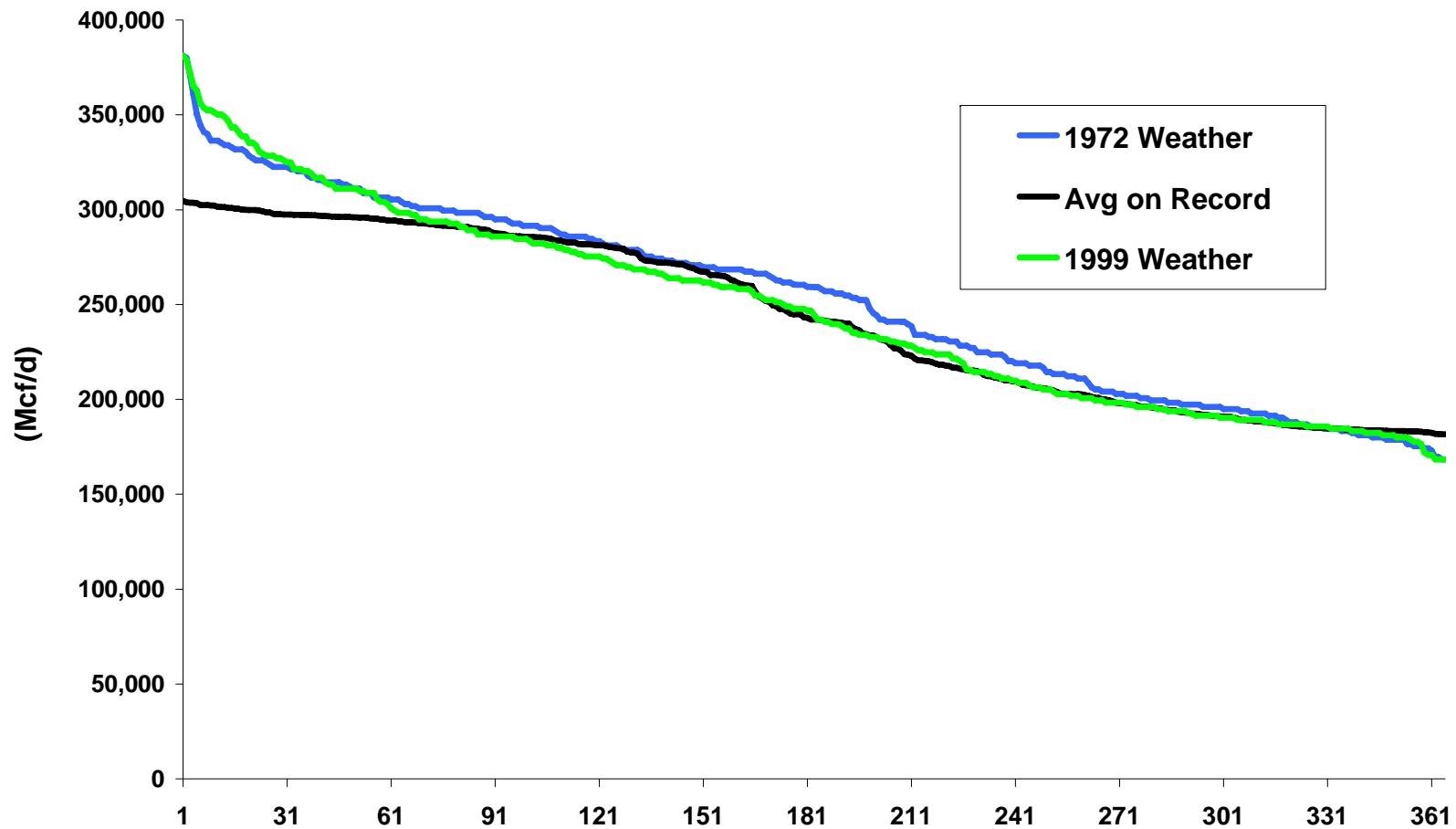
# Anhydrous Ammonia (NH3) Destination Value



# Peak Deliverability Requirements

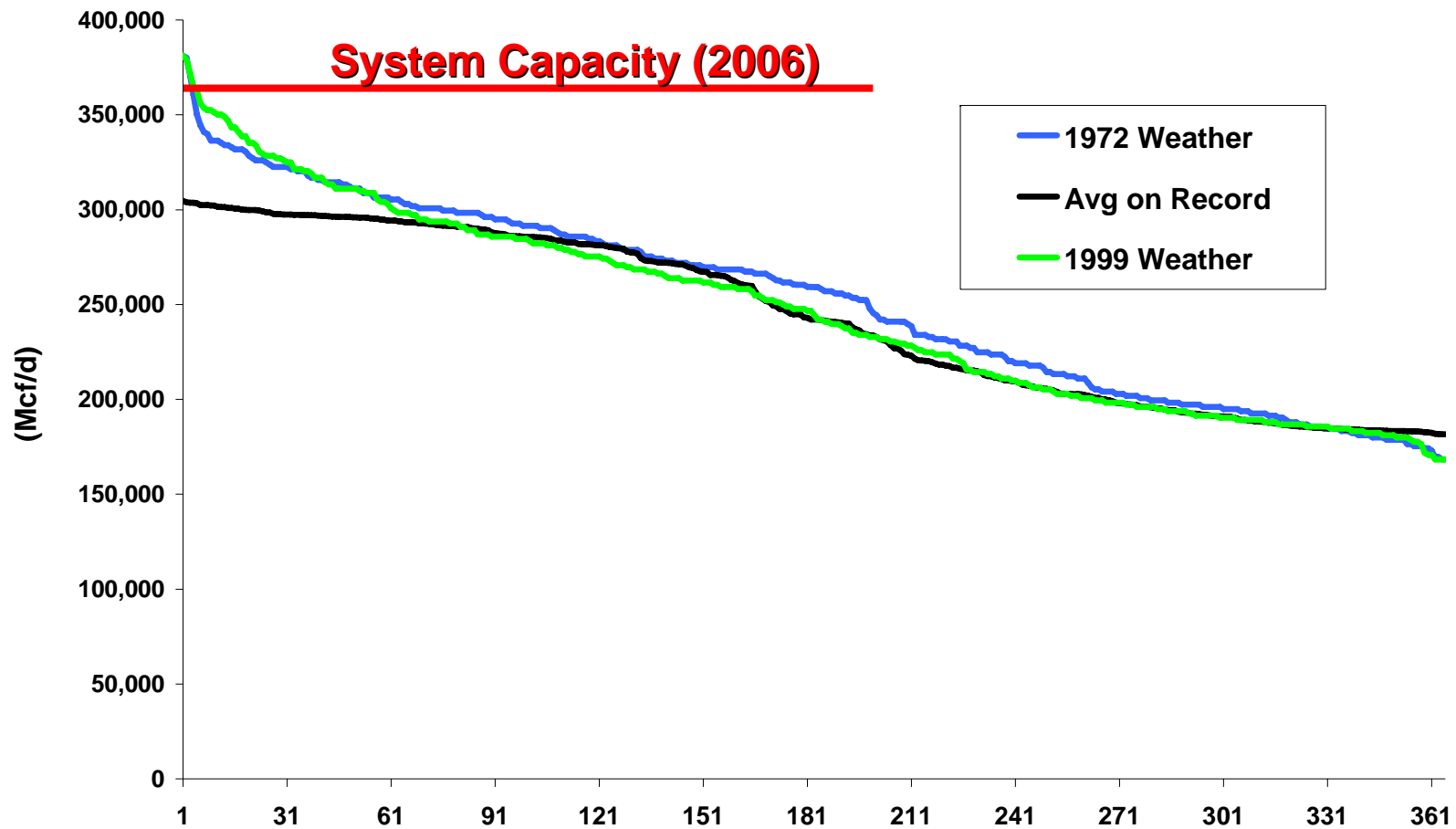
- R&C and GFEG - Big Seasonal Swing
- Capacity of Producing Fields & Pipe
  - Just Enough to Serve Peak – TODAY!
  - Three Gas Storage Projects Underway
- Industrials Provide Backstop Deliverability if needed

# Load Duration Curves



Includes Residential & Commercial, GFEG, Tesoro, and Other Industry;  
excludes LNG Plant and Fertilizer Plant.

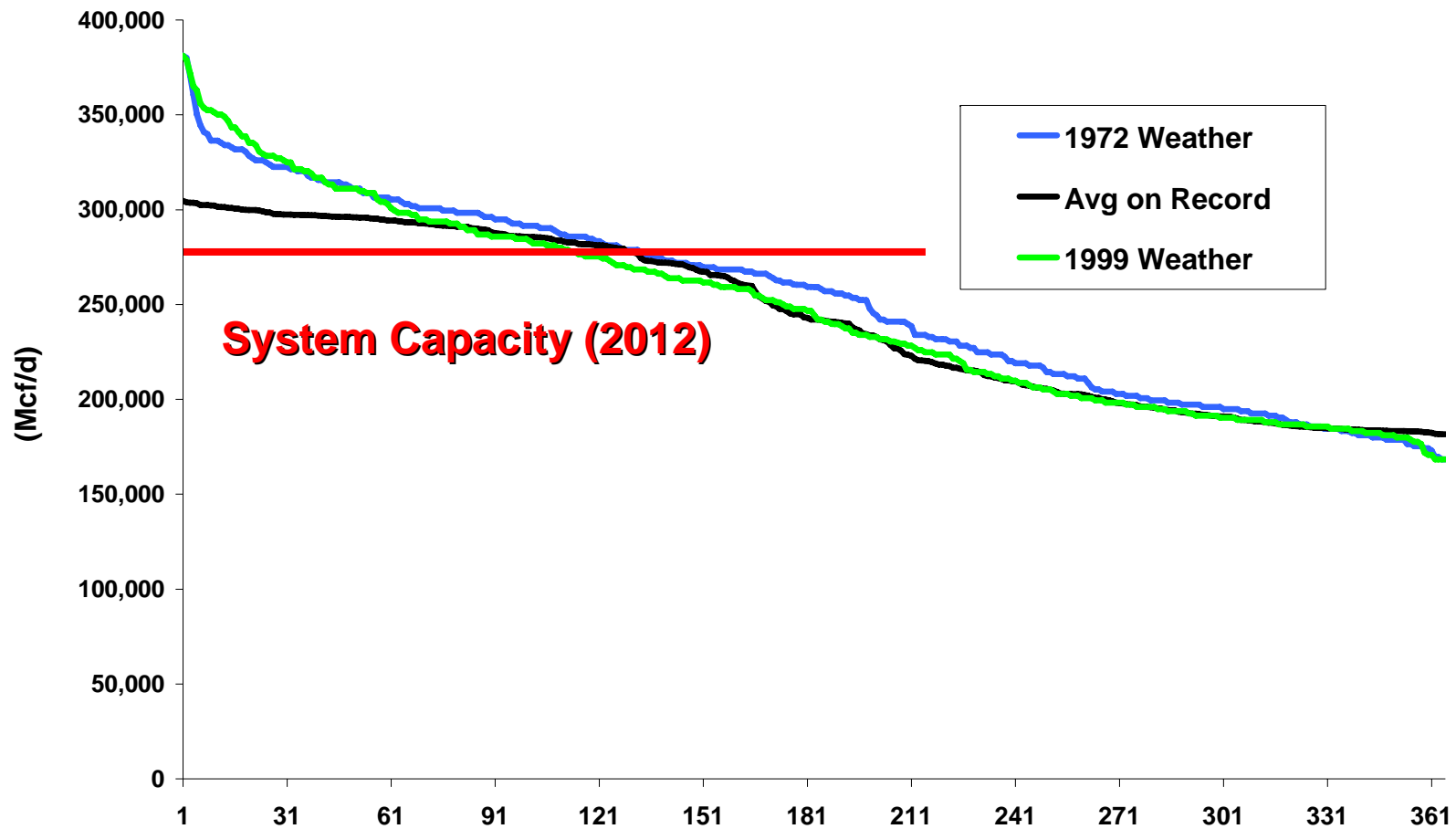
# Load Duration Curves



Includes Residential & Commercial, GFEG, Tesoro, and Other Industry;  
excludes LNG Plant and Fertilizer Plant.



# Load Duration Curves



Includes Residential & Commercial, GFEG, Tesoro, and Other Industry;  
excludes LNG Plant and Fertilizer Plant.

# Conclusion (Part 1)

## Sea Change or Steady State?

- Pendulum Swings
  - Era of Excess Gas Supply is Past
  - Projected Decline in Proved Reserves
  - Peak Deliverability
- Positive Price Pressure
  - Linkage with Lower-48
  - Not Market Failure
  - R&C Exhibits some *Elasticity*
- Gas Storage Important Component
- Industrials Constrained by Supply / Price

# **Conclusion (Part 2)**

## **Consequences of Industrial Demand Erosion**

- Deliverability Backstop
- Incentive to Explore
- Shared System Costs
- Temporary Fix
- Spur Line Economics