LSU Natural Gas Conference

Presented by:

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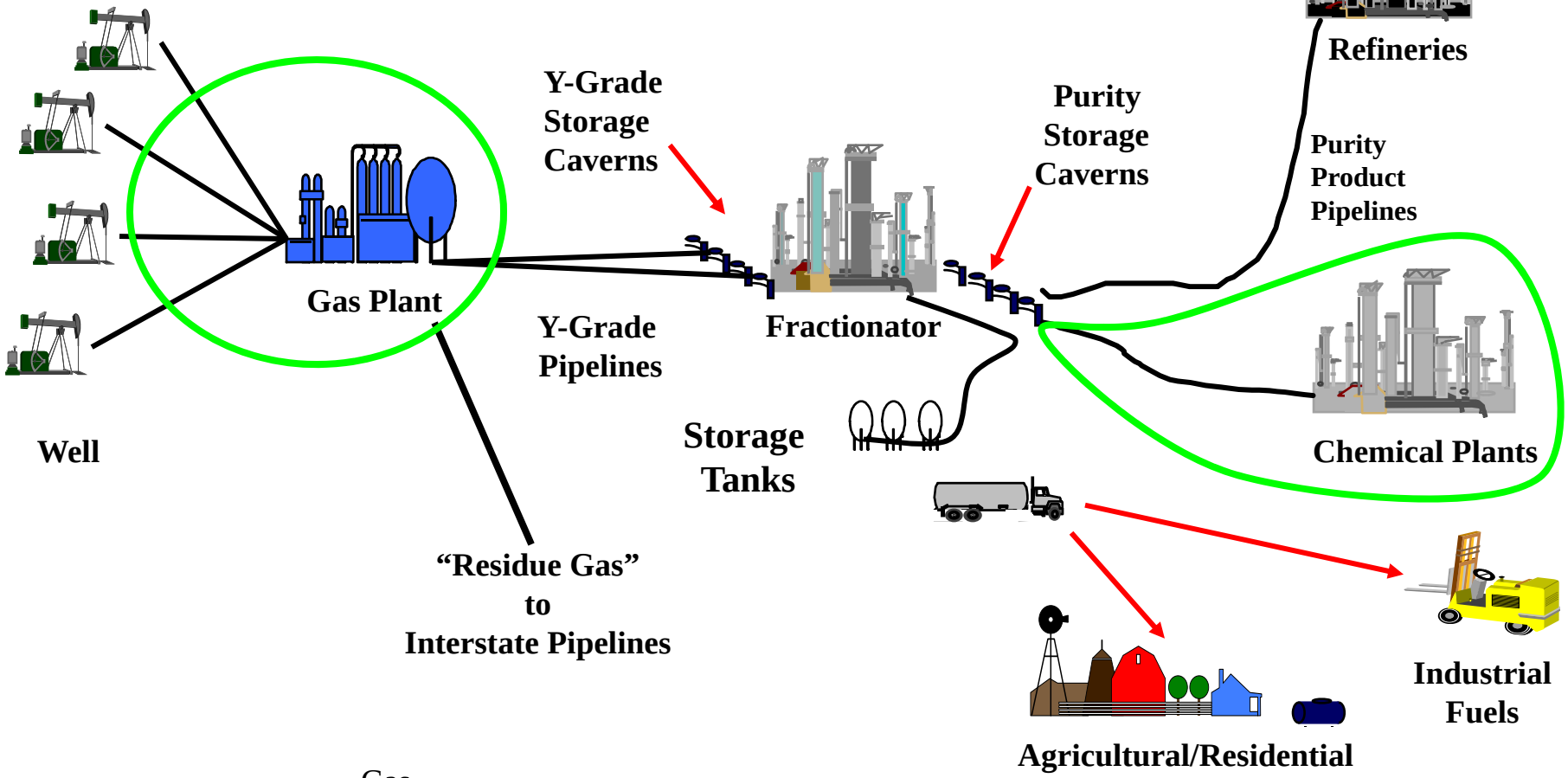
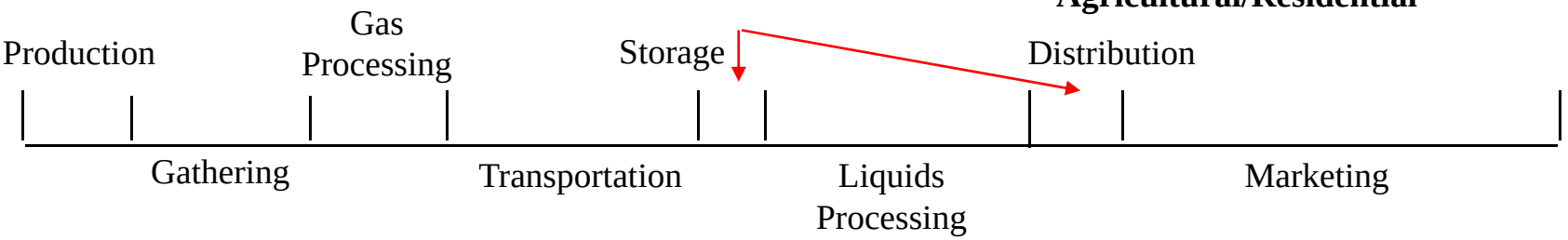
Williams Companies

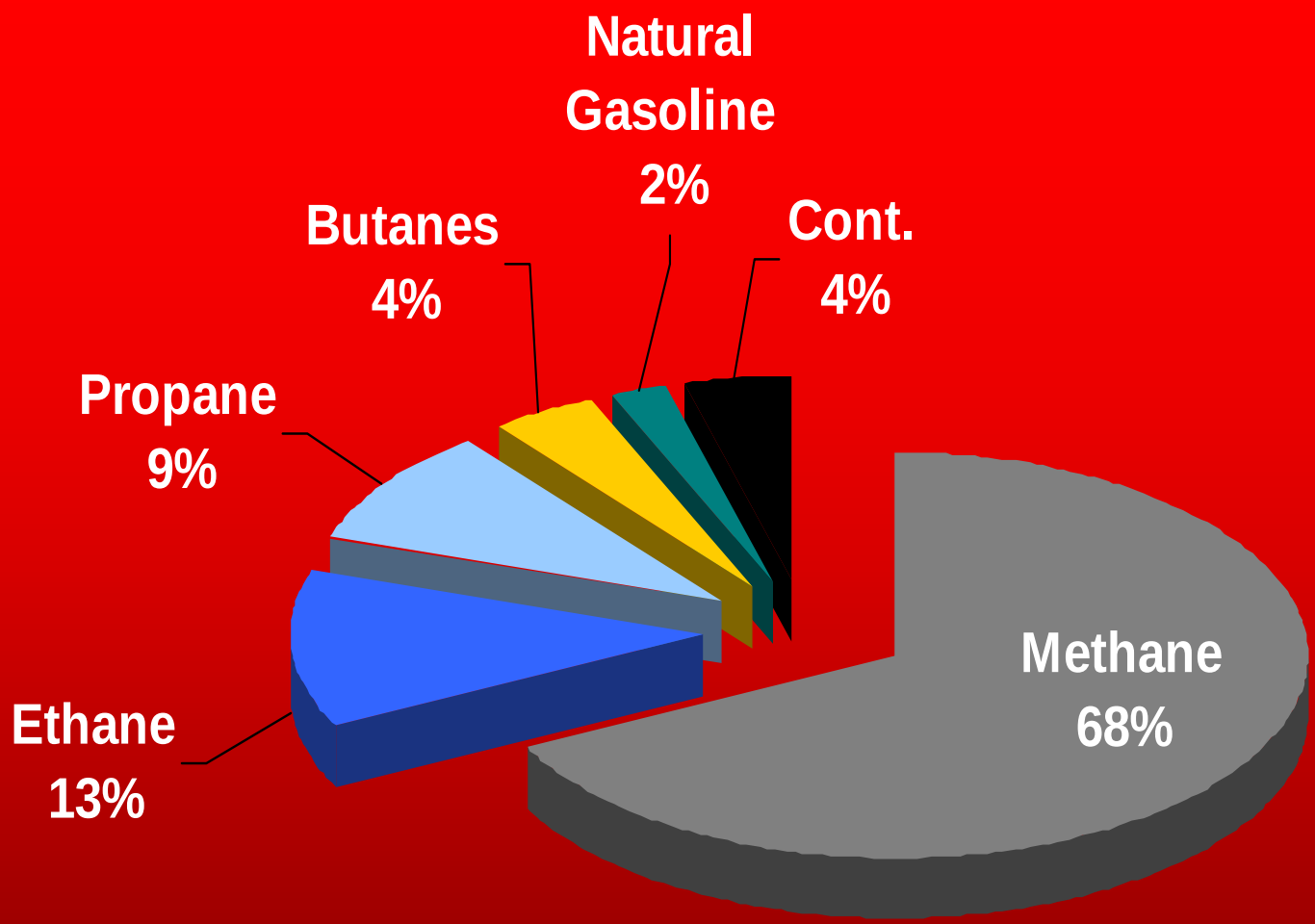
Introduction

- Structural shift in natural gas pricing
- The crude to gas ratio: A critical relationship for NGL processing
- Implications of a sustained shift in gas, crude, and NGL pricing relationships
  - Implications for ethane
  - Implications for heavier NGL's

Hydrocarbon Value Chain



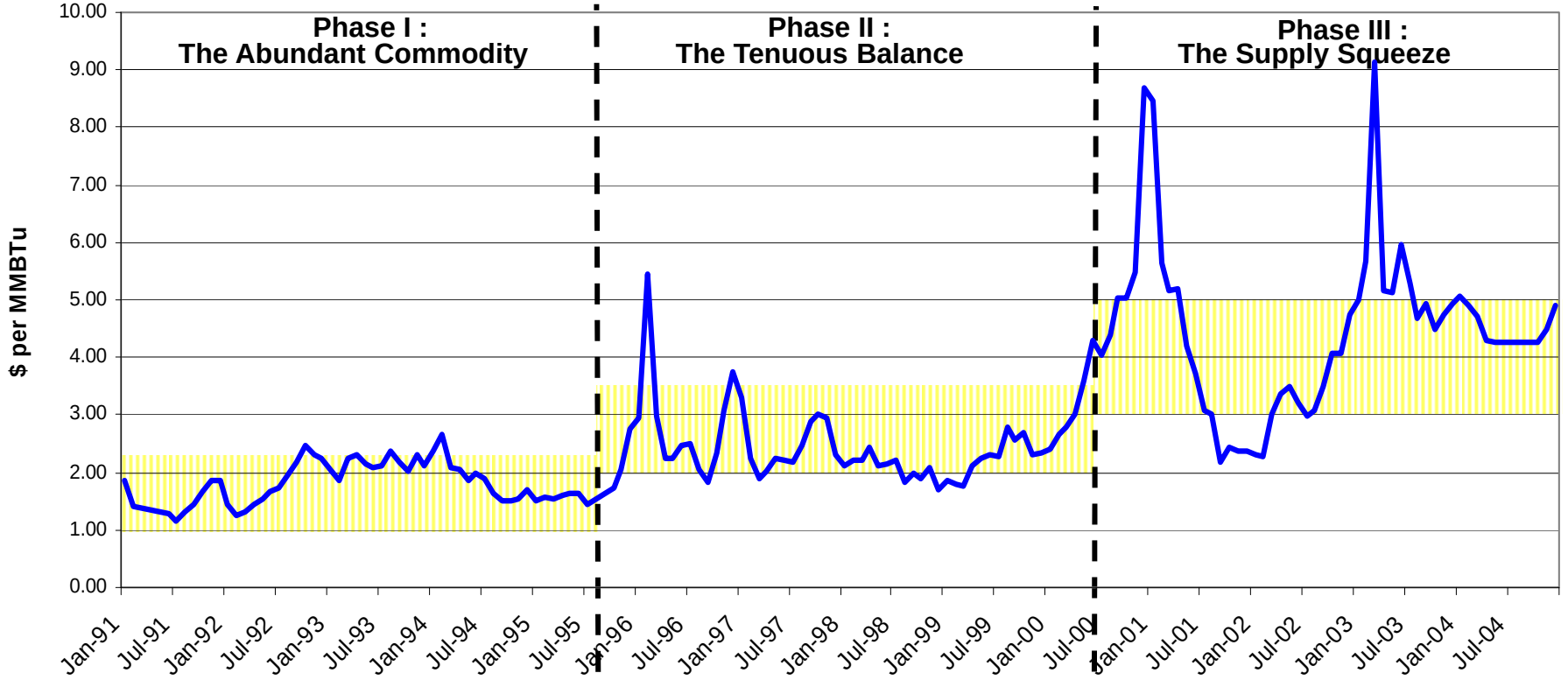




TYPICAL UNPROCESSED GAS

Evolution of Gas Pricing in North America

Henry Hub Natural Gas Price



Supply Perspective

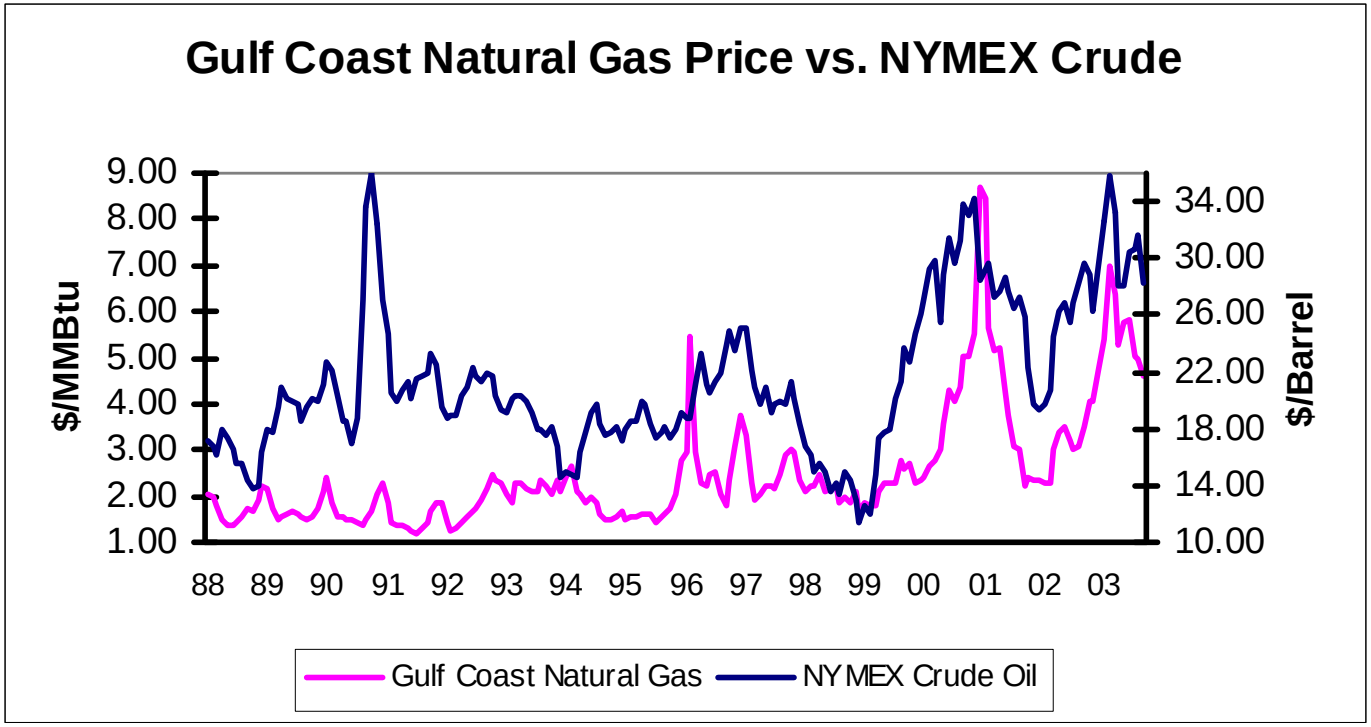
- **"Just Another Commodity"**
- **Manufacturing Strategies**

- **Declines in Traditional Basins**
- **Select "Growth Regions"**
- **Advent of the Deepwater**
- **Growing Imports**

- **The Supply Treadmill**
- **Prospect Shortfall**
- **Unprecedented Volatility**
- **Growth of Frontiers**

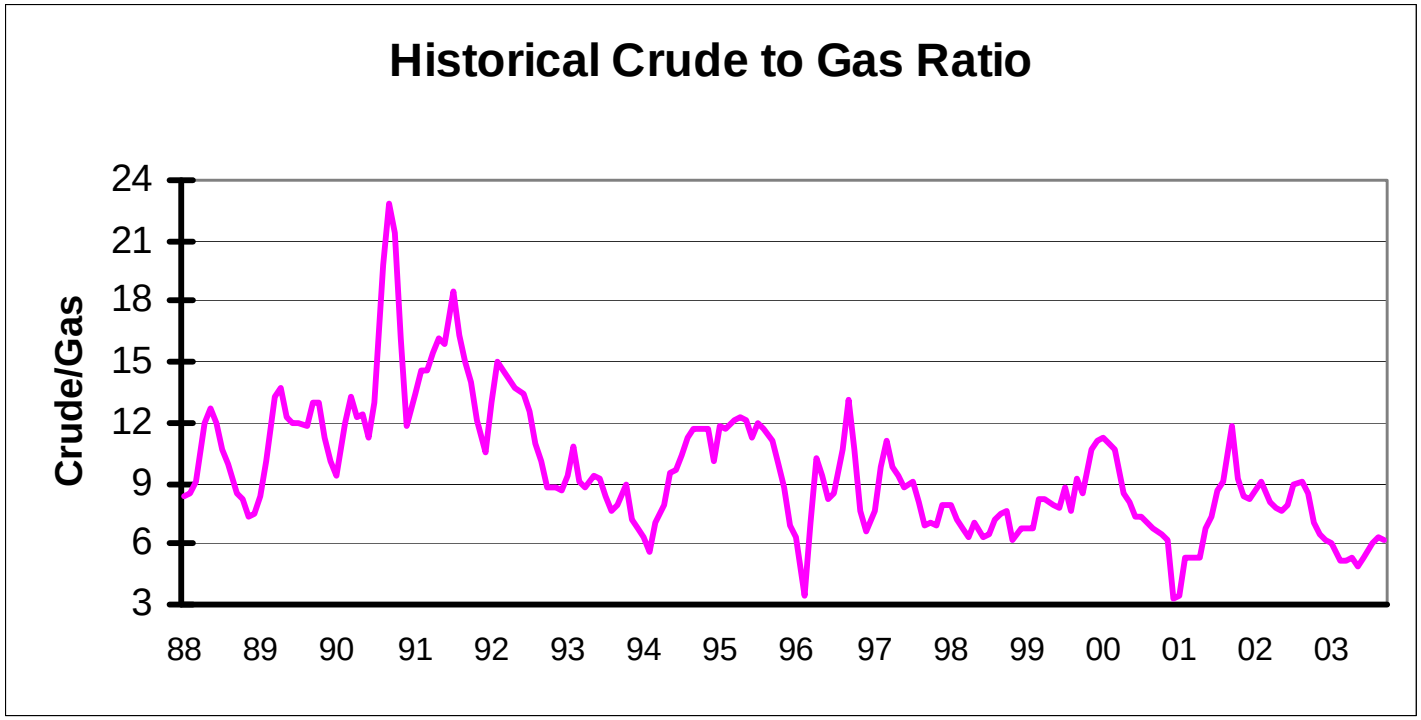
Source: Platts

The Crude to Gas Relationship



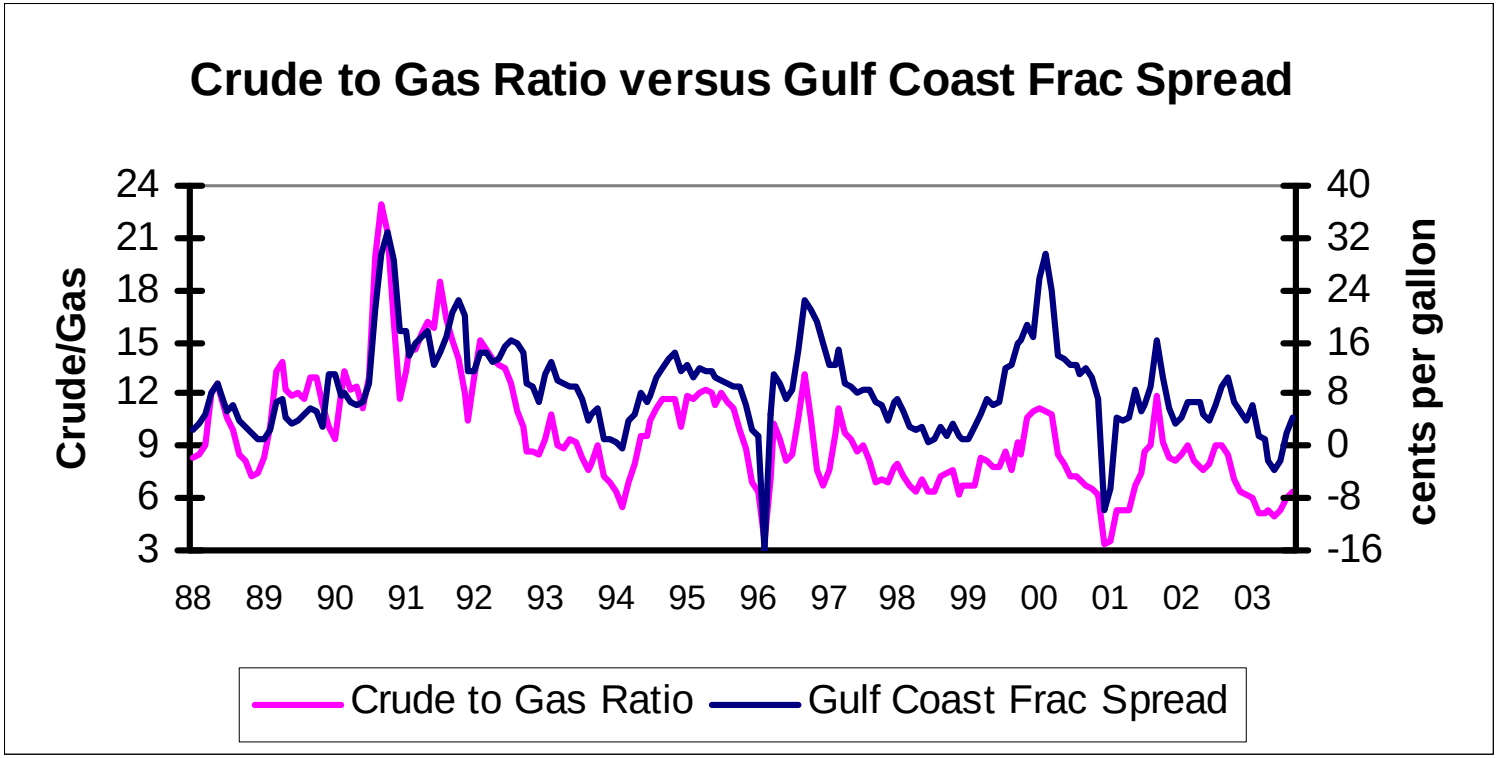
- The relationship between natural gas and crude has varied widely over time

The Crude to Gas Relationship



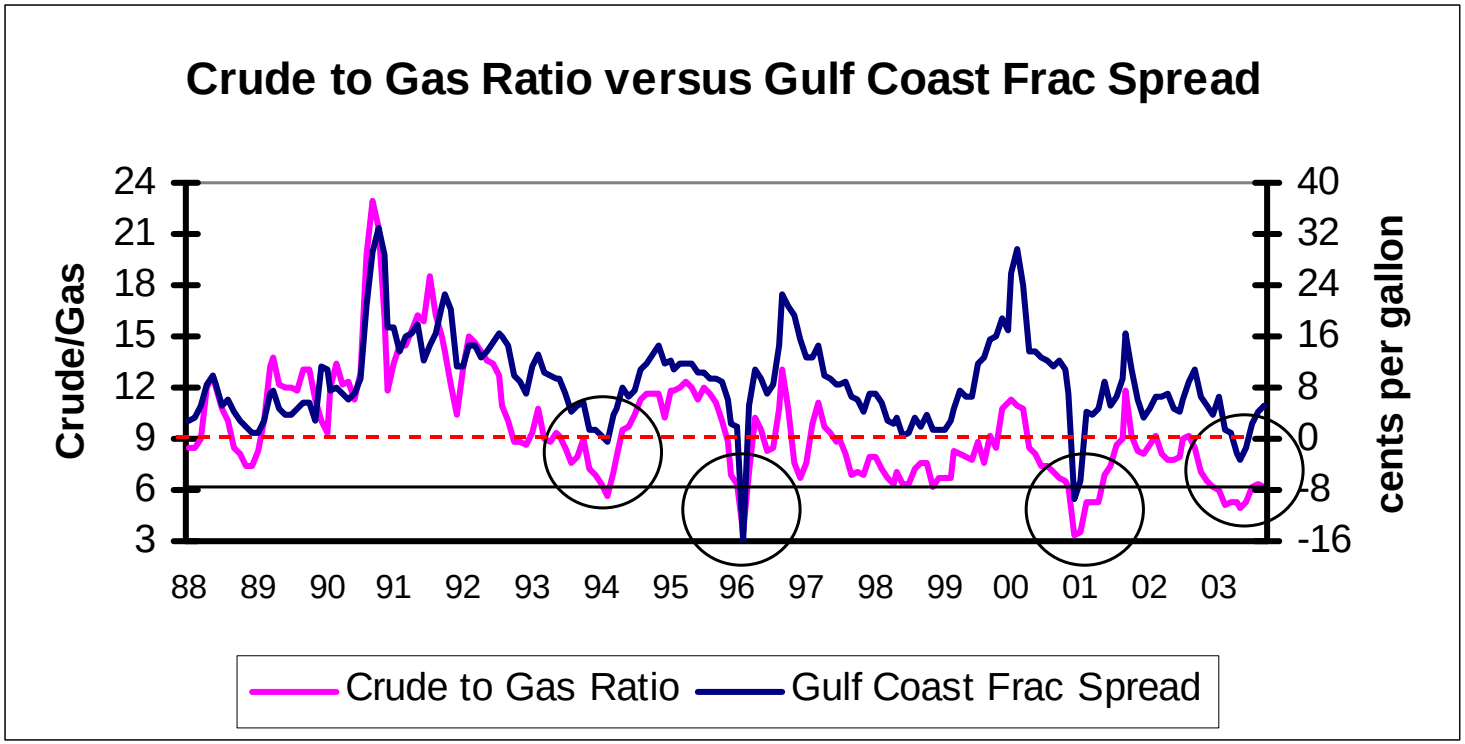
- The crude to gas ratio (crude divided by gas) has trended down as gas has strengthened relative to crude oil

The Crude to Gas Relationship



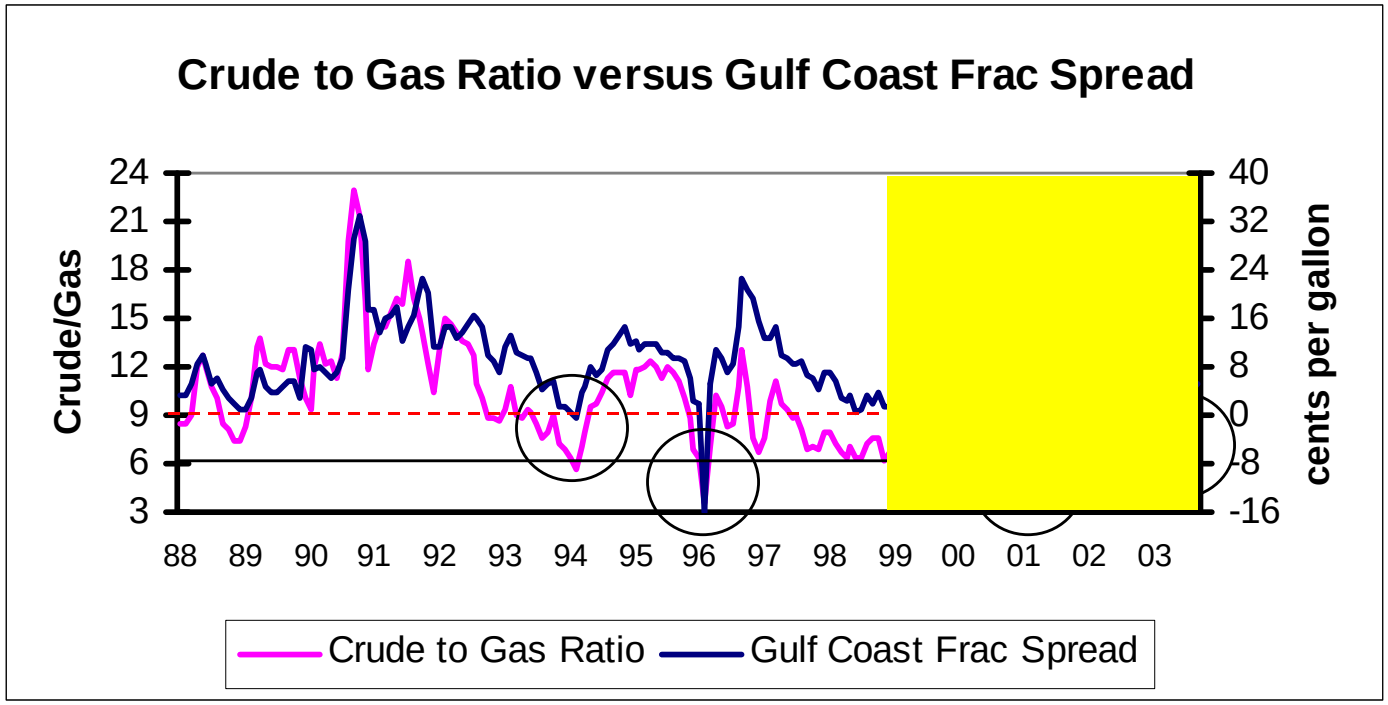
- The crude to gas ratio correlates highly with historical NGL processing spreads

The Crude to Gas Relationship



- Historically, low points in the crude to gas ratio have meant hard times for gas processors

The Crude to Gas Relationship



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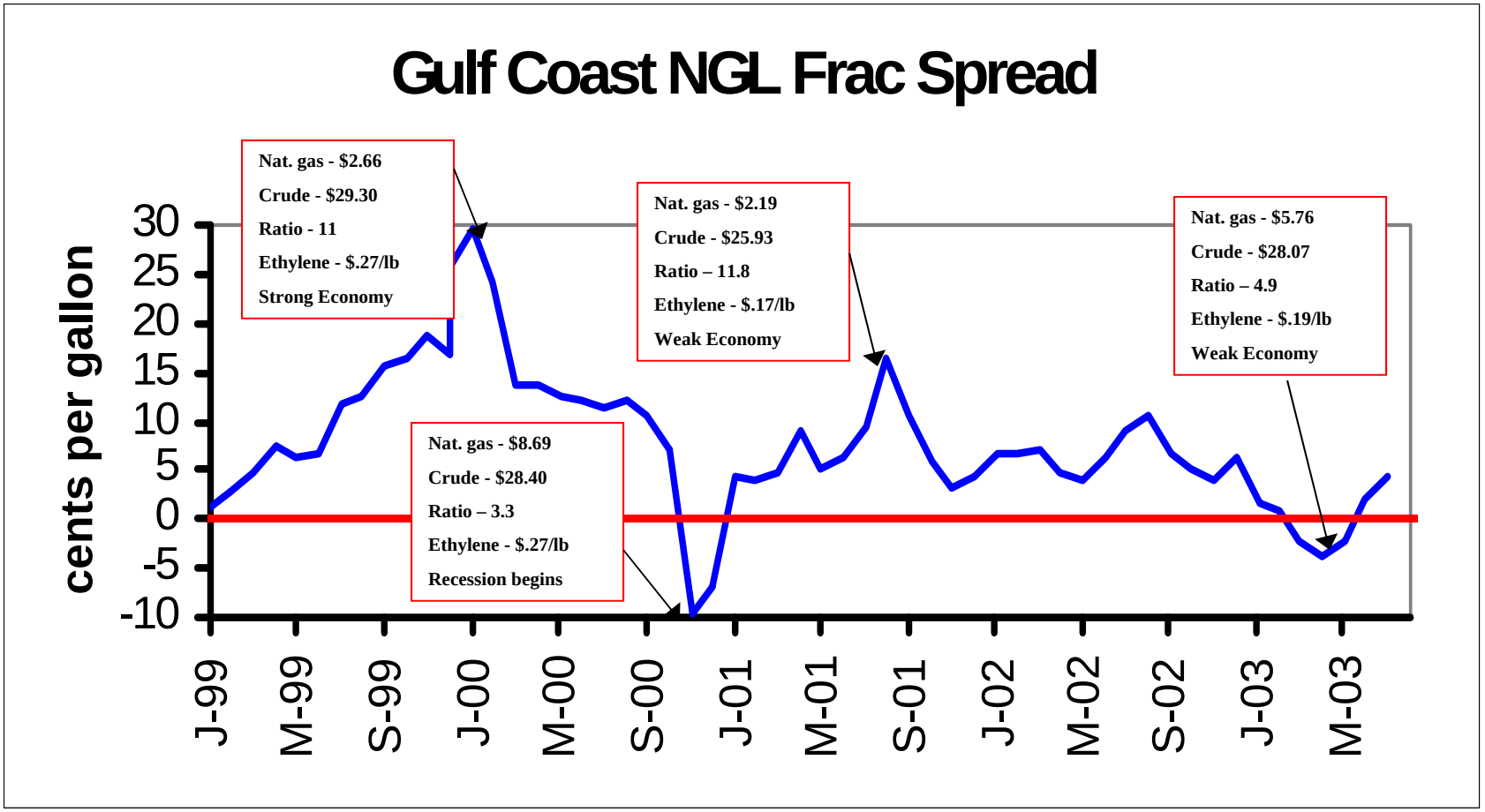
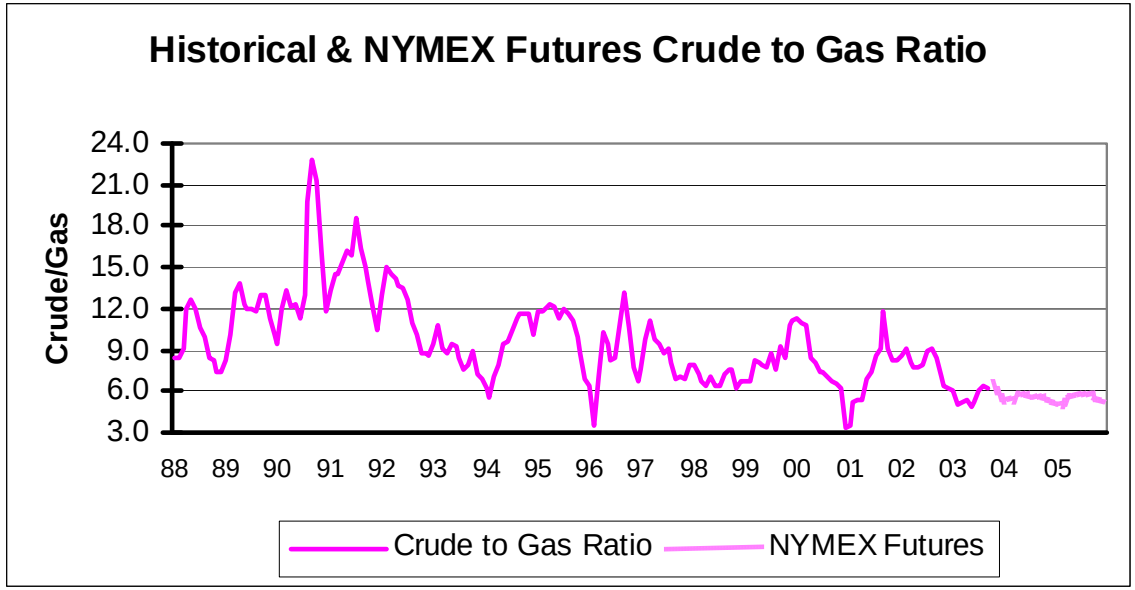


- Analysis of recent frac spreads – the economy also plays a role…

The Crude to Gas Relationship

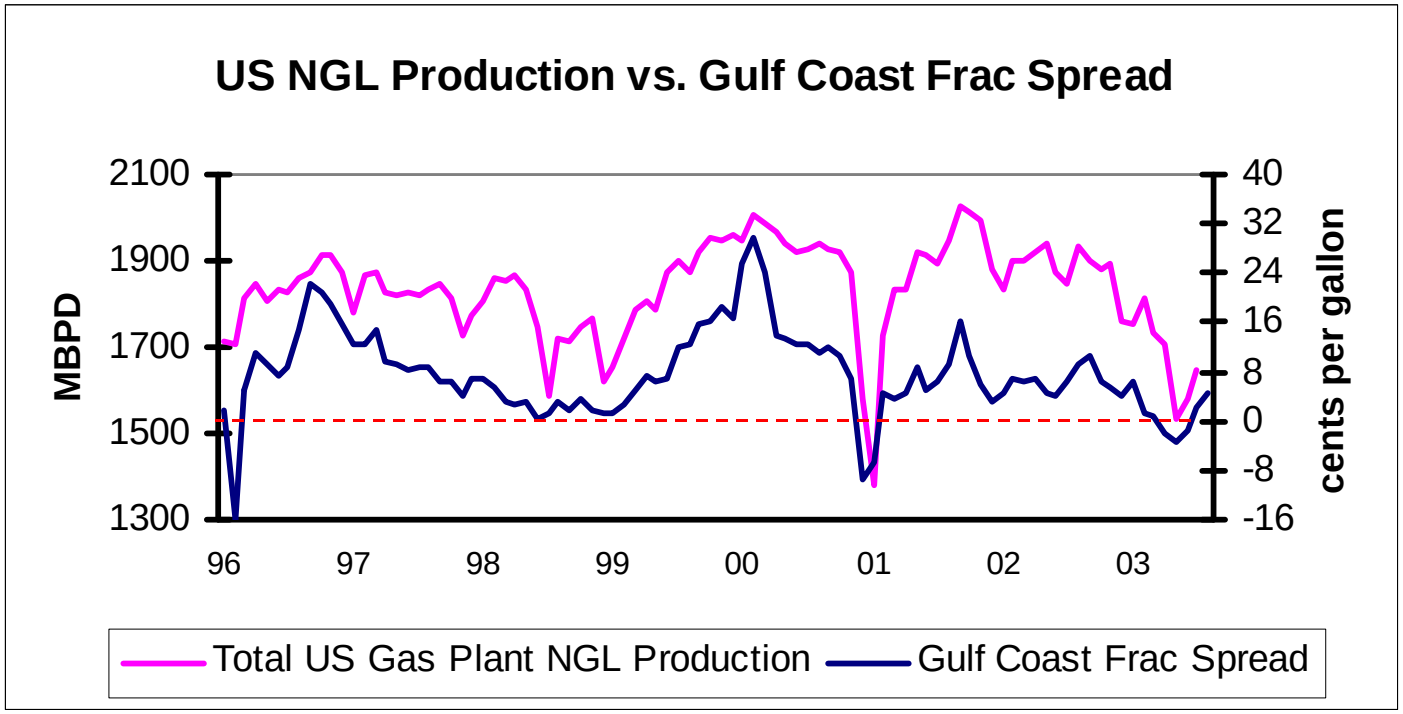
	Natural Gas	Crude Oil	Crude/Gas Ratio
Oct-03	4.430	29.10	6.6
Nov-03	4.830	28.82	6.0
Dec-03	5.082	28.35	5.6
Jan-04	5.262	27.94	5.3
Feb-04	5.212	27.65	5.3
Mar-04	5.107	27.33	5.4
Apr-04	4.802	27.03	5.6
May-04	4.709	26.81	5.7
Jun-04	4.719	26.61	5.6
Jul-04	4.724	26.41	5.6
Aug-04	4.724	26.25	5.6
Sep-04	4.721	26.10	5.5
Oct-04	4.729	25.96	5.5
Nov-04	4.861	25.84	5.3
Dec-04	5.004	25.72	5.1
Jan-05	5.091	25.62	5.0
Feb-05	5.036	25.53	5.1
Mar-05	4.881	25.43	5.2
Apr-05	4.561	25.34	5.6
May-05	4.456	25.27	5.7
Jun-05	4.456	25.22	5.7
Jul-05	4.463	25.19	5.6
Aug-05	4.463	25.18	5.6
Sep-05	4.463	25.17	5.6
Oct-05	4.488	25.17	5.6
Nov-05	4.668	25.17	5.4
Dec-05	4.843	25.18	5.2

Note: As of 9/30/2003



- Current NYMEX price strips suggest a continuation of low crude to gas ratios

Implications of the Pricing Trends



- Unprecedented NGL rejection has occurred during periods of low ratios/low frac spreads

Implications of the Pricing Trends

During January of 2001

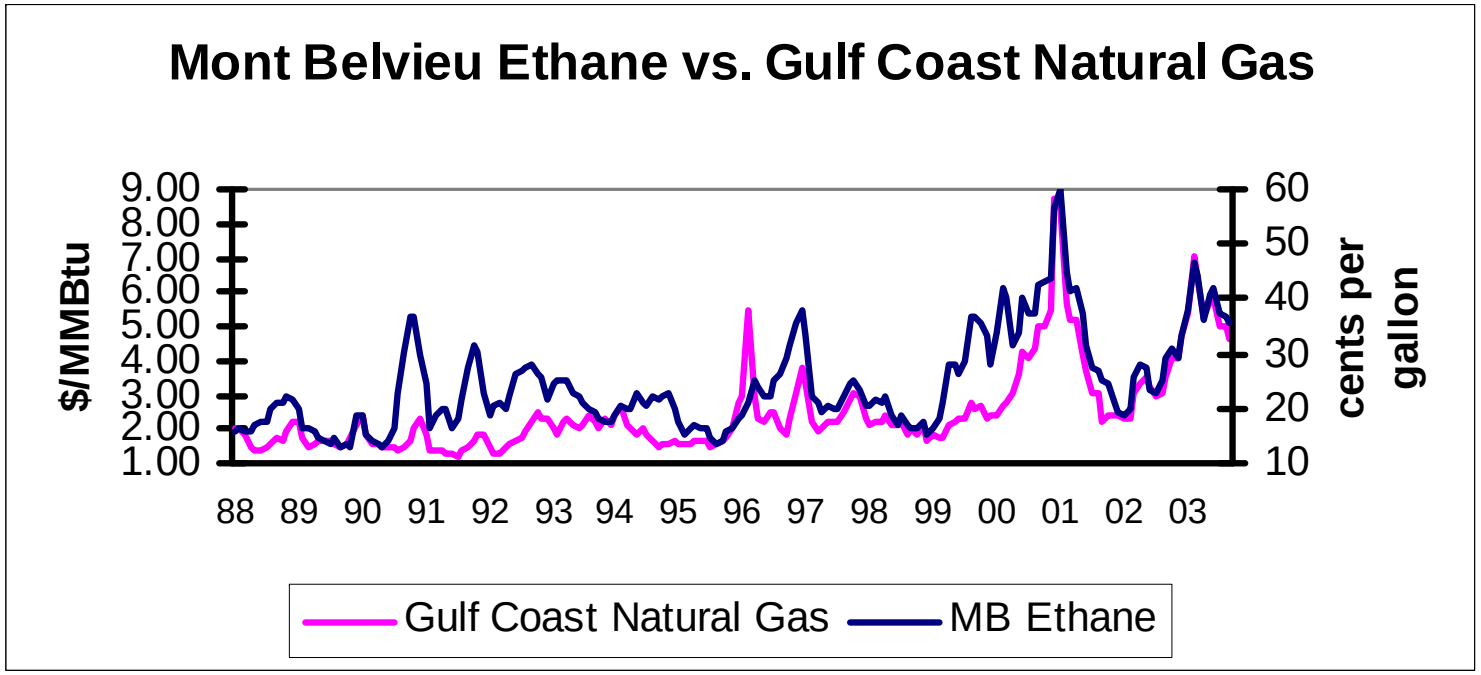
- 1/3 of total NGL production – lost to rejection
- 650 MBPD
- 2.2 BCFD natural gas

Between May and August of 2003

- 200 MBPD of ethane and 80 MBPD of propane remained in natural gas stream
- 0.85 BCFD

The US has seen some degree of continual ethane rejection for the last year

Implications - Ethane

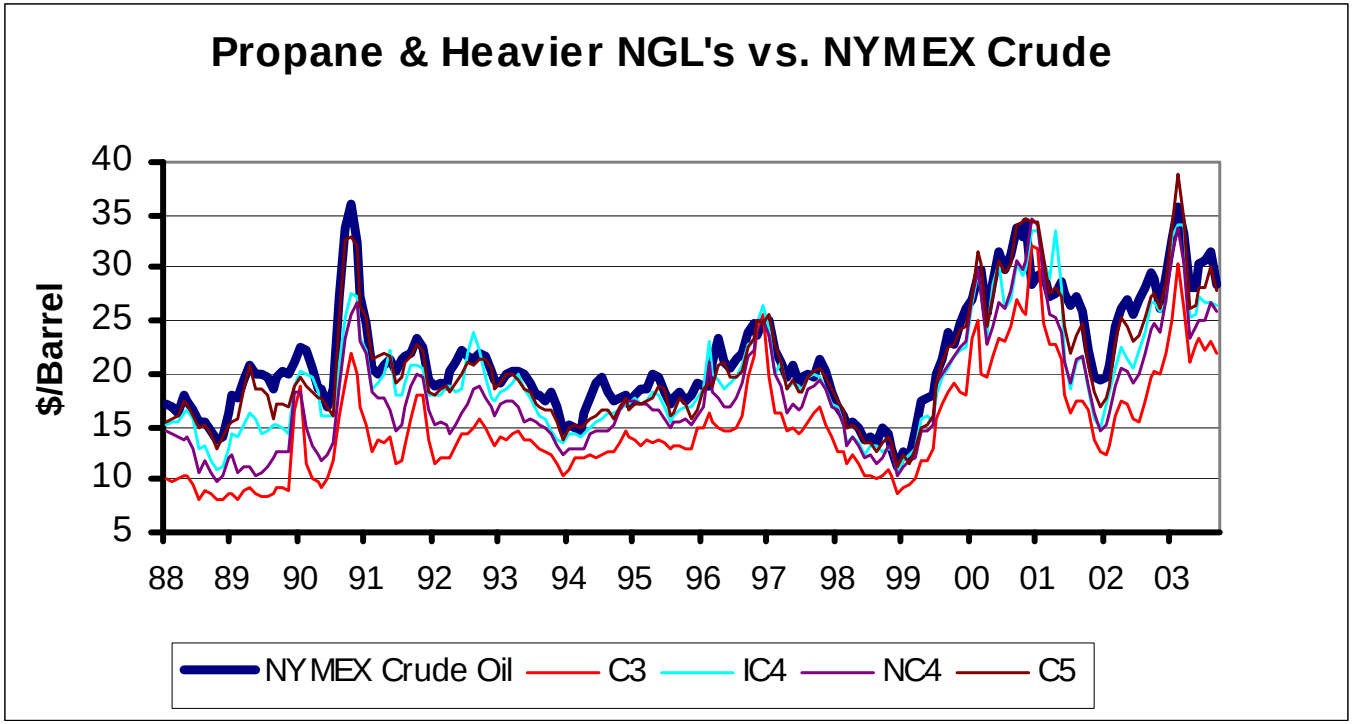


- Because it is the most readily rejected NGL, ethane is the most responsive NGL to changes in gas price

Implications - Ethane

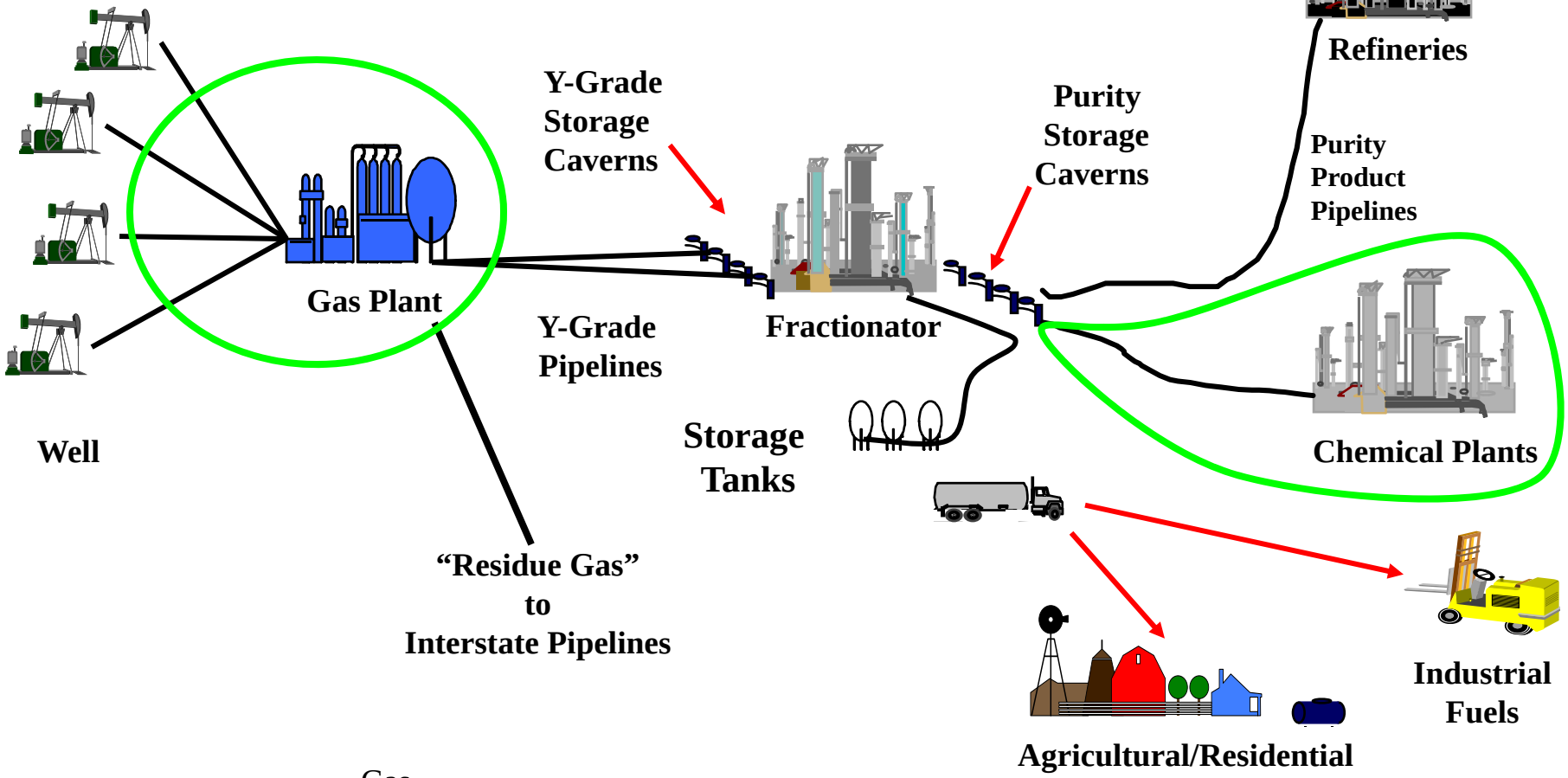
- High gas prices relative to crude oil places ethane at a competitive disadvantage to heavier petrochemical feedstocks
- While ethane production suffers, demand for ethane has been equally weak
- Despite weak production, ethane inventories are near the 5-year-average

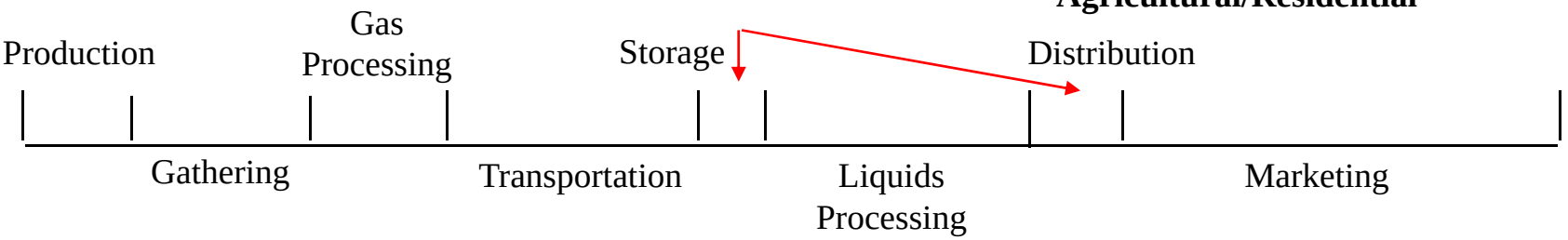
Implications - Heavier NGL's



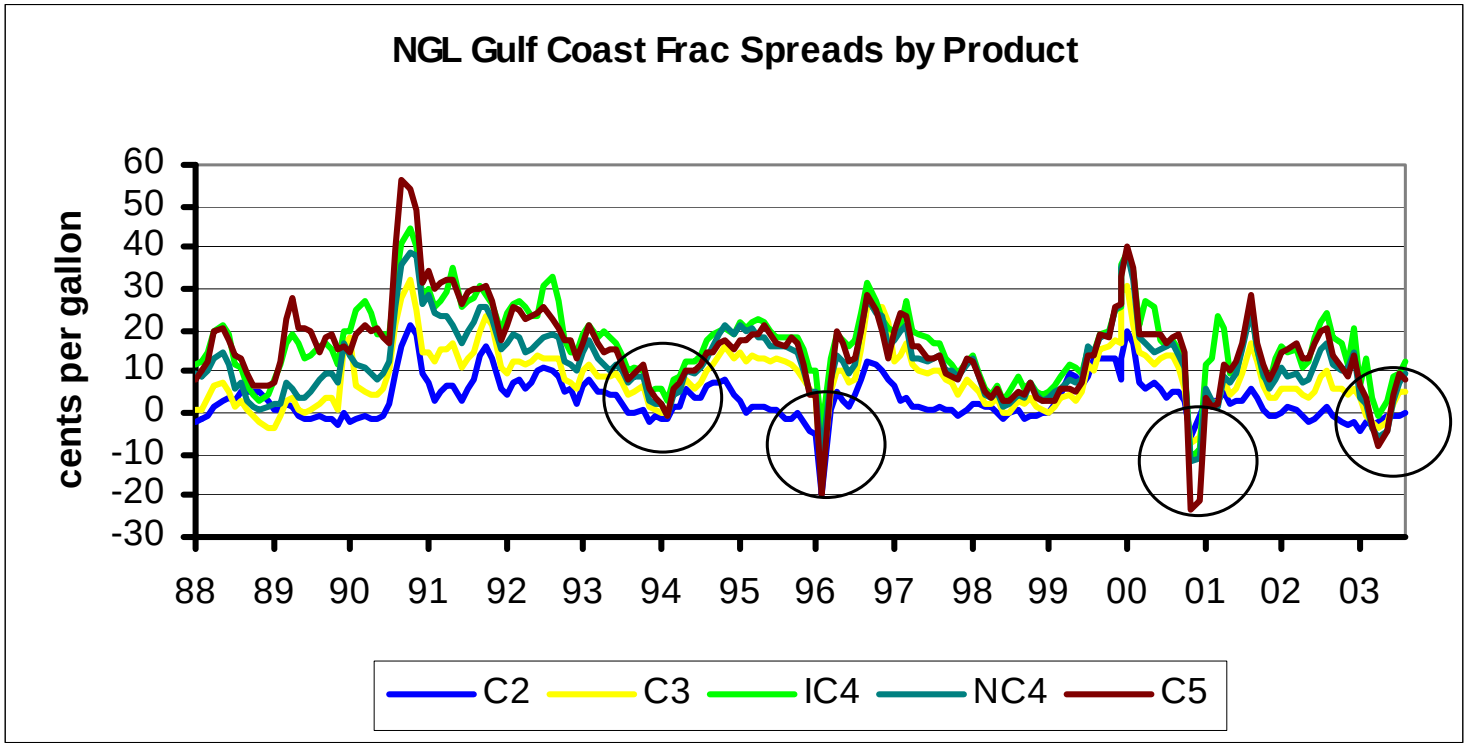
- The heavier NGL's are highly correlated to crude oil…

Hydrocarbon Value Chain



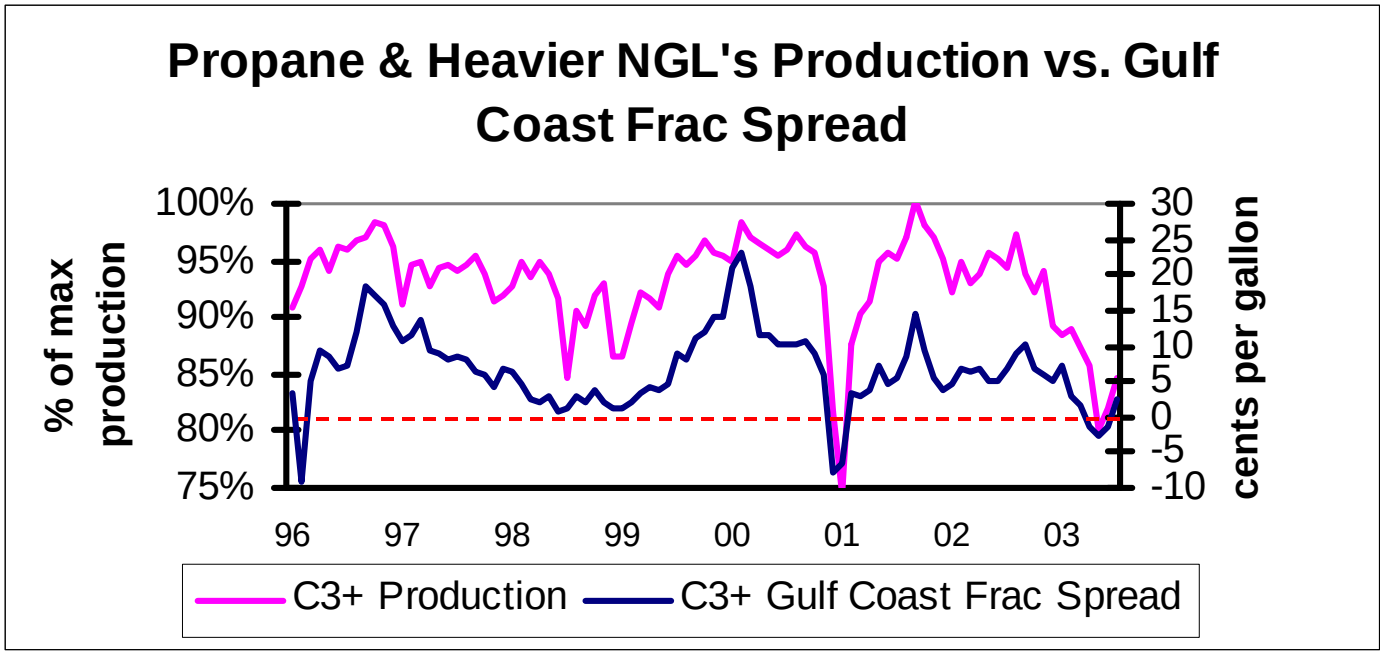


Implications - Heavier NGL's



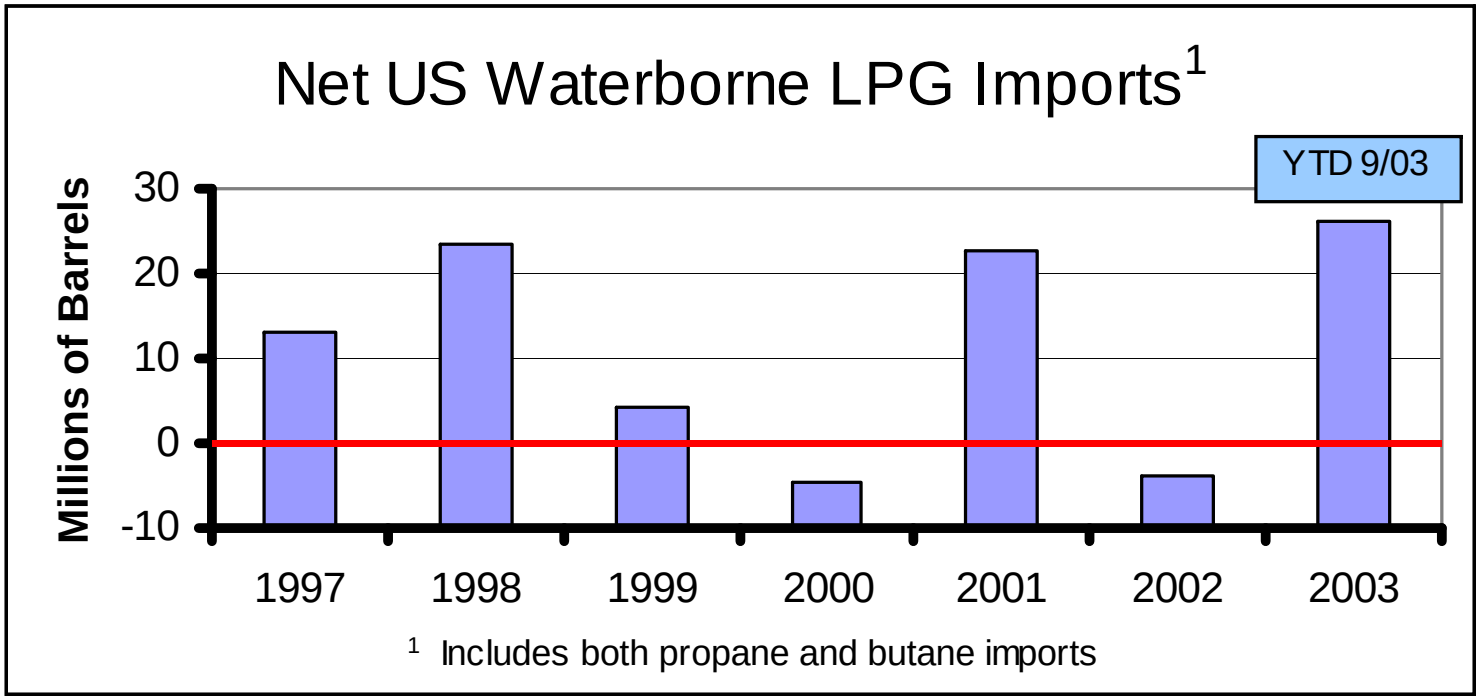
- …meaning that their processing margins are hardest hit when crude to gas ratios are low

Implications - Heavier NGL's



- Weak processing margins do result in some lost production of heavier NGL's

Implications - Heavier NGL's



- However, heavy waterborne imports supplement propane and butane supplies…

Implications - Heavier NGL's

API US NGL Inventory Levels (Millions of Bbls)

	Current 8/31/03	Five-Year Average	% Over/ Under	w/out Waterborne Imports
Ethane	21.8	22.1	**-1.2%**	**-1.2%**
Propane	63.0	65.9	**-4.4%**	**-33.3%**
N. Butane	33.4	40.9	**-18.3%**	**-30.5%**
I. Butane	7.5	8.2	**-7.5%**	**-32.0%**
N. Gasoline	9.1	9.2	**-0.5%**	**-0.5%**
Total NGL's	**135.0**	**146.3**	**-7.8%**	**-25.5%**

- Keeping inventories closer to five-year averages

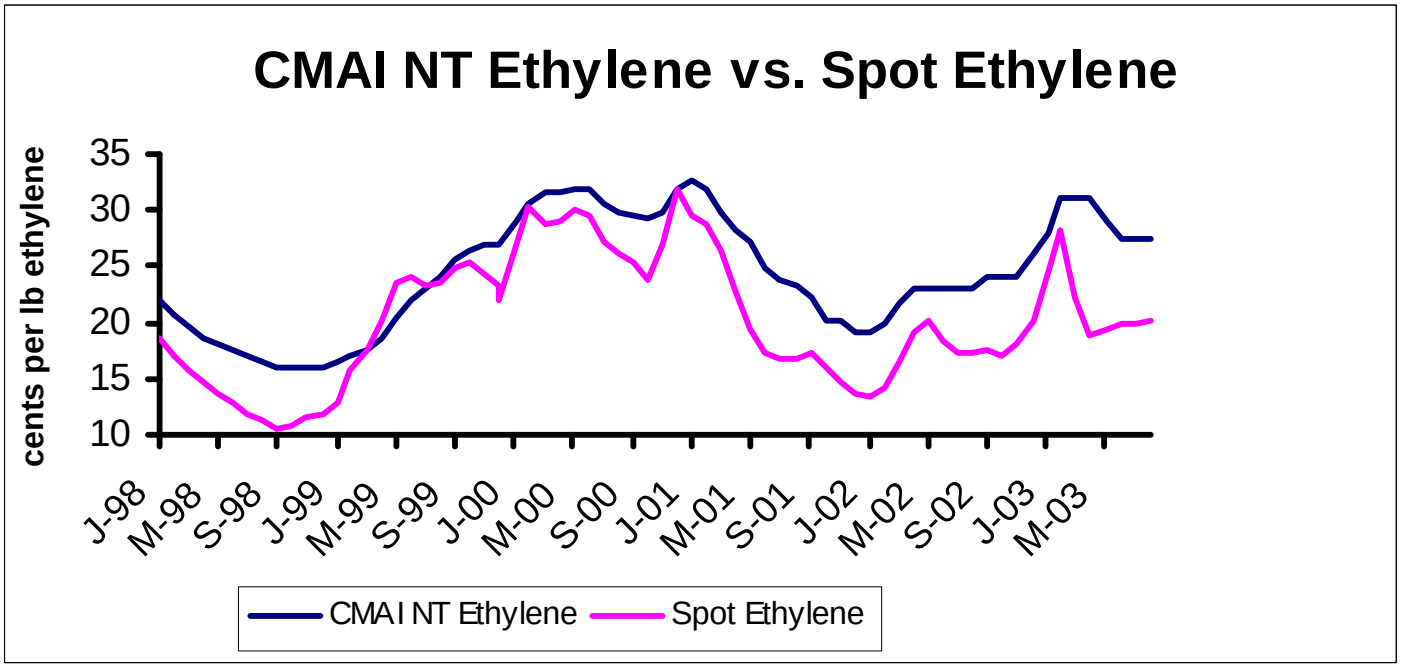
Merchantability

- The heavy rejection of NGL's in recent years has caused significant operational problems for natural gas pipelines
- In response, natural gas pipeline companies have begun issuing "merchantability" notices
- These notices enforce the requirement that some NGL's be removed to meet pipeline specs before entering the system

Conclusions

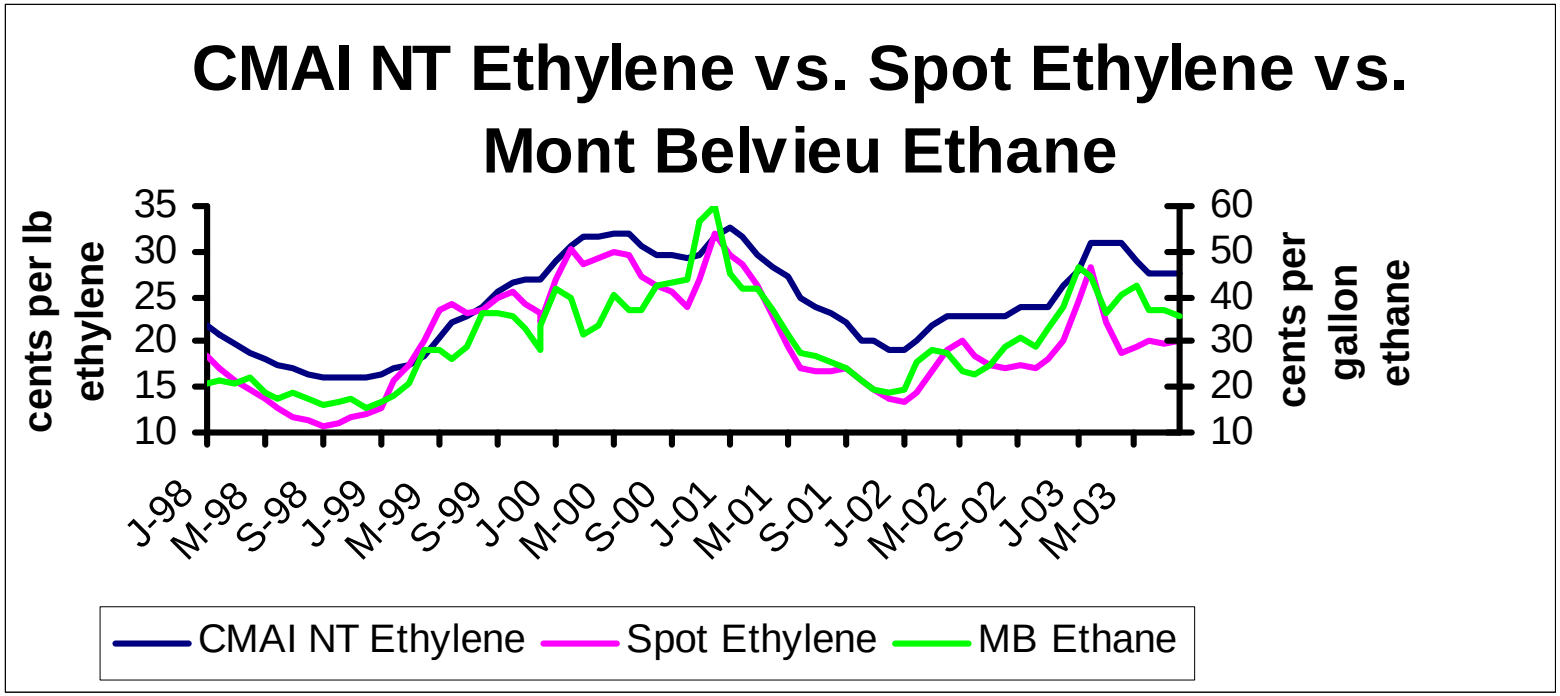
- Strengthening natural gas prices relative to crude oil have significantly reduced the production of NGL's in the US
- Waterborne imports will continue to play a critical role in balancing the heavier NGL's
- The weakened feedstock desirability of ethane, combined with a struggling economy, have reduced demand and kept ethane supplies in balance

Conclusions



- The growing gap between NT and spot - an indication of an inactive spot market

Conclusions



Conclusions

- High natural gas prices will result in high feedstock costs for ethane
- Ethane pricing quickly responds to pricing changes in natural gas
  - Reasonable price transparency
- Probable margin squeeze within ethylene chain
  - Improving economy
  - Minimal ethylene price transparency

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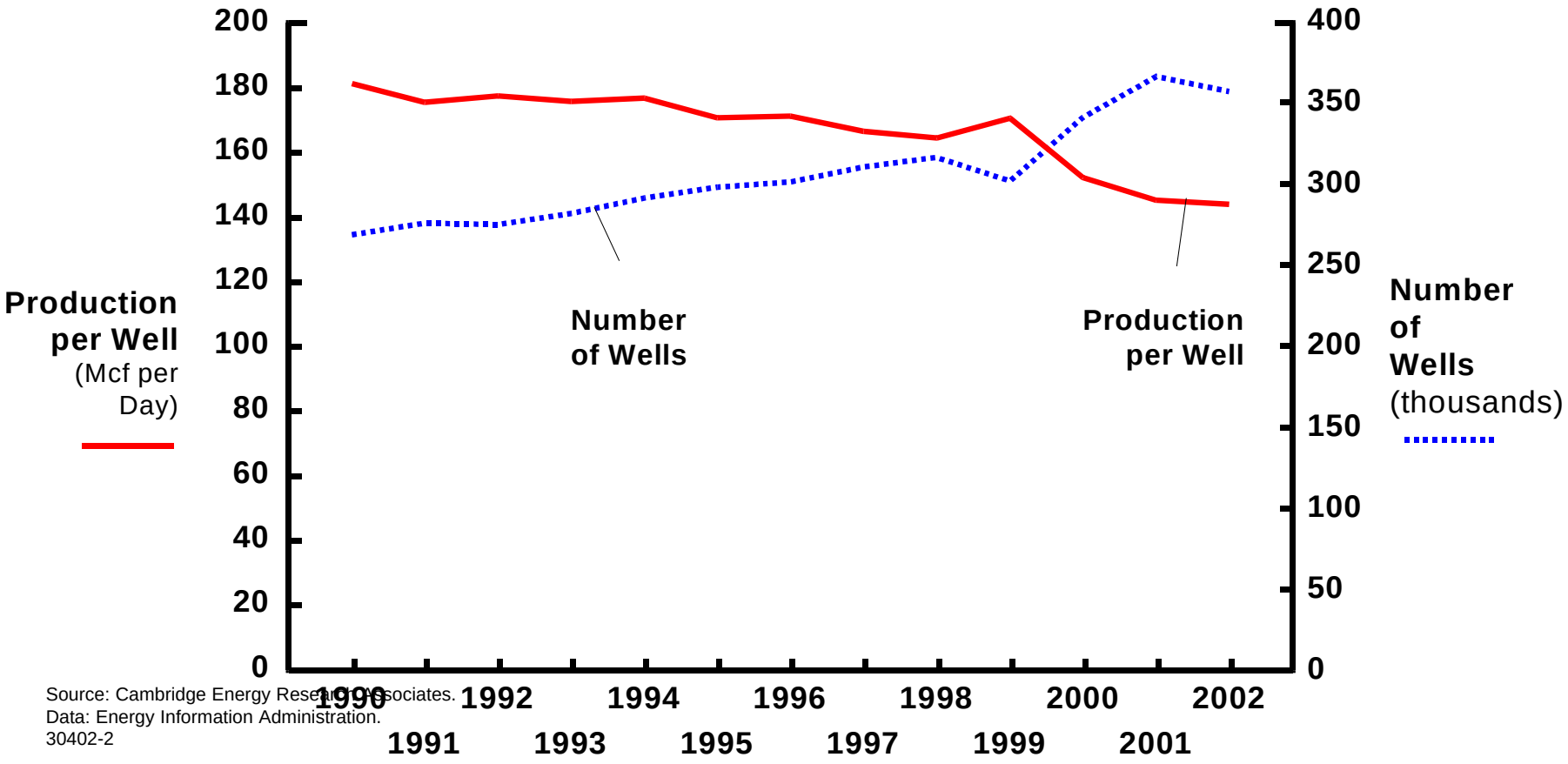
Structural Shift – Supply Side

- Many traditional North American supply basins are in decline
- Western Canadian production, the marginal supply of the last decade, is prominent among the declining basins
- LNG and Arctic gas represent the marginal supply of the new era, but it will take years to develop the infrastructure

Structural Shift – Supply Side



Source: Cambridge Energy Research Associates.
Data: Energy Information Administration.
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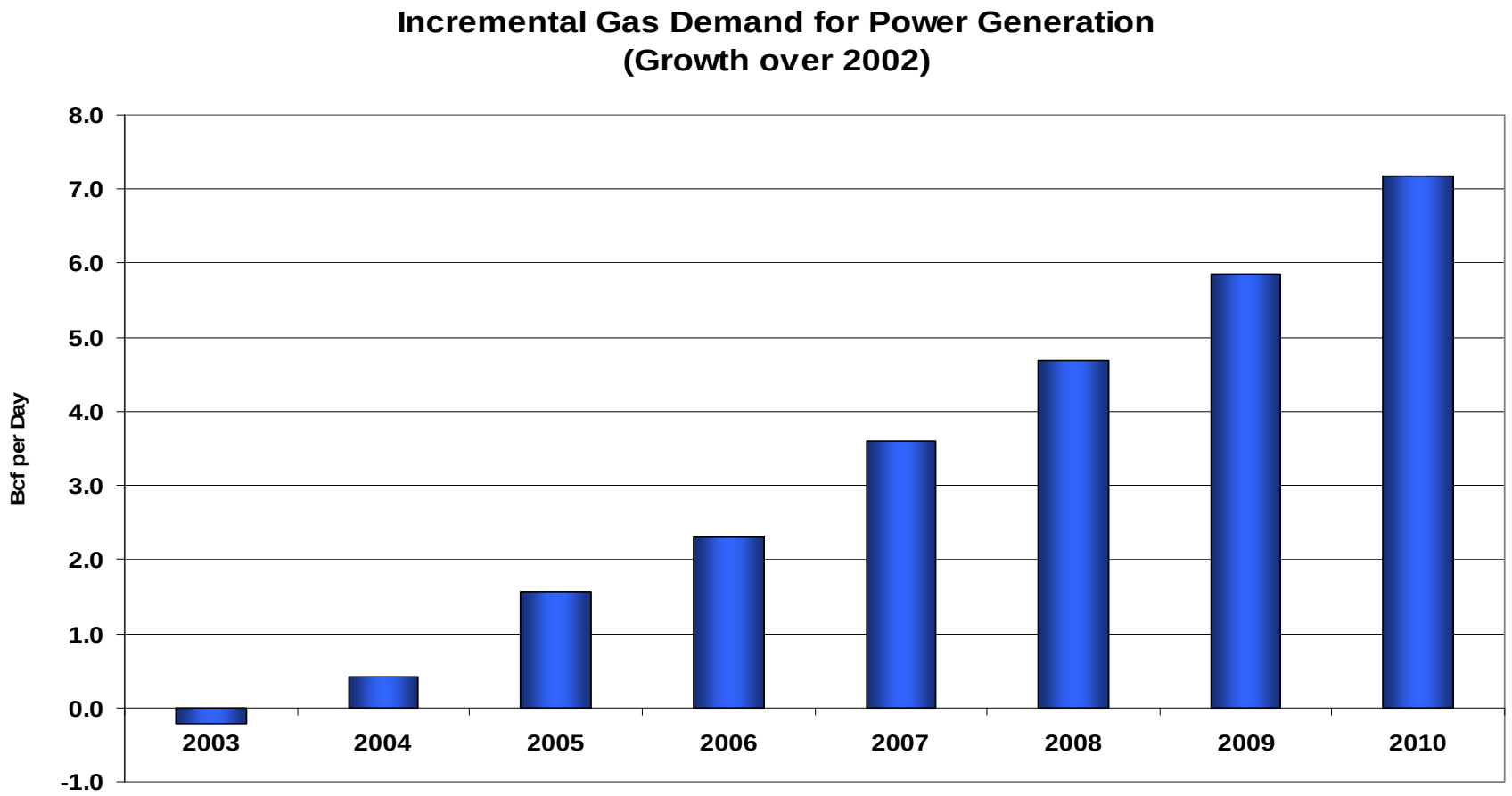
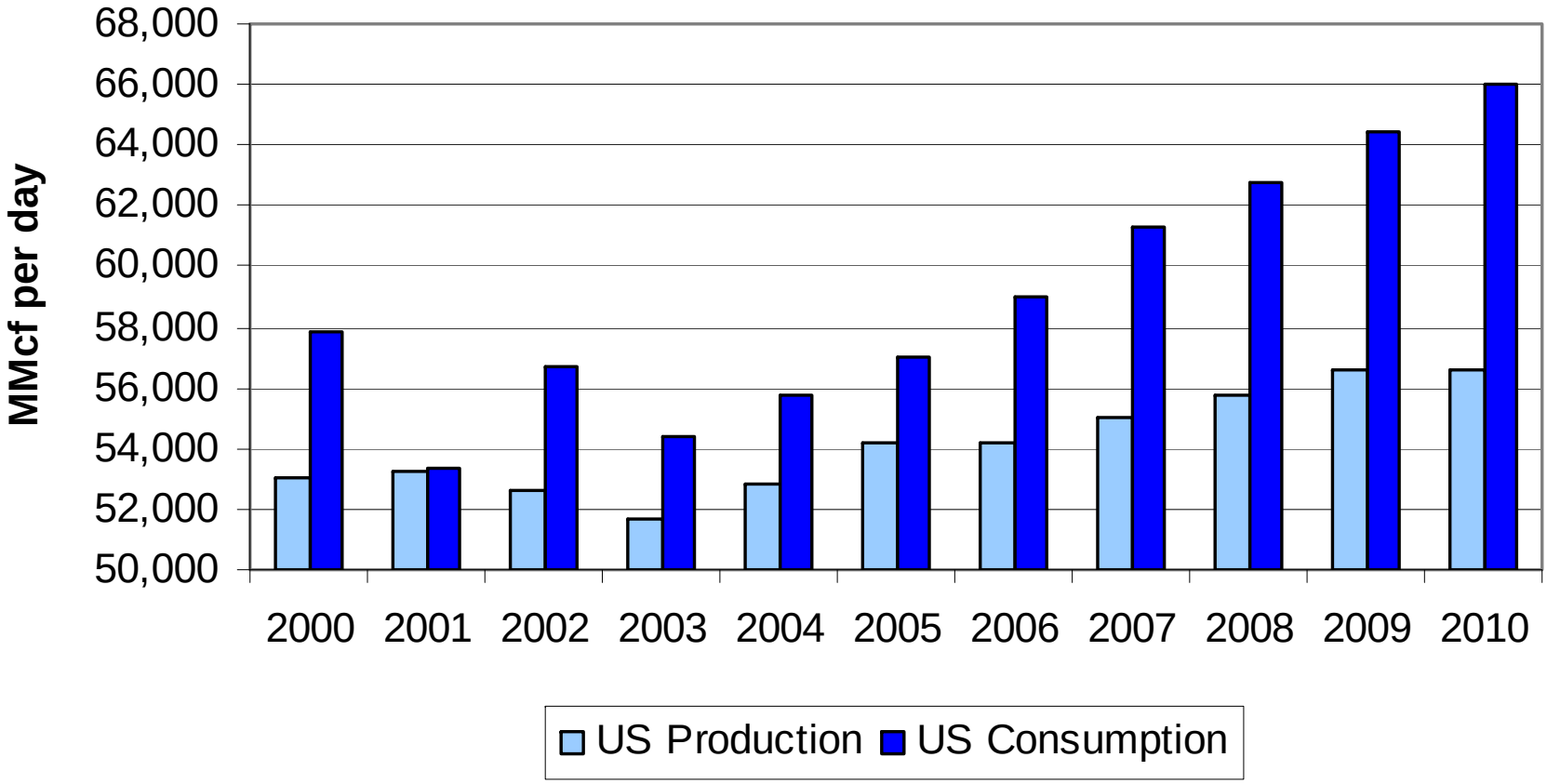
- More wells have not meant more production

Structural Shift – Demand Side



- Expected increases in future natural gas demand for power generation…

Structural Shift - Supply Gap



Note: Consumption excludes pipeline, lease and plant fuel. Production excludes imports, storage and balancing adjustments.