

Implications for the US gasoline market

Elimination of RFG oxygen standard

Complete Phase Out of MTBE?

How Bad Can It Get?

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“Vision is the art of seeing things invisible to others”
- Jonathan Swift 1776



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What Will Drive Summer Gasoline Prices ?

- Prices will continue to increase if marginal demand exceeds marginal supply
- Gasoline supplies can be constrained by either the crude supply or by the “quality” supply in the gasoline pool (i.e. octane, lo-sulfur, MSAT, etc)
- Change in Physical Inventories is both a lagging and a poor (sometimes false) indicator of supply / demand imbalances
- Changing relationships between market prices are a much better indicator of supply imbalances (decreasing excess capacity) for gasoline and crude oil

but, the “Gasoline – WTI” crack spread may now be much less effective

Atmospheric crude oil capacity is not a reliable indicator of refinery gasoline processing capacity or “quality” capability

Summer gasoline supplies will be constrained by “clean” octane capability (i.e. EPA approved Octanes for use in gasoline)

Environmental Regulations Decreasing Octane (and Gasoline) Supplies

- **Lead Octane Phasedown from Mid 1970 to Mid 1980's**
- **RVP Controls phased down summer butane blending (11.5 RVP to 7 RVP) from Mid 1970 to Mid 1980's (Loss 9 vol % of 94 Octane Butane)**
- **Aromatics reduced from 32% to 20% in 1995 RFG areas (in 32% of US gasoline)**
- **TIER II Sulfur removal destroying ~ 0.5 octane number on gasoline pool**
- **MTBE being removed with loss of legal liability shield (RFG Oxygen Standard)**
- **Octane Supplies in rest of Atlantic Basin Market decreasing –
Europe reduced aromatics from 42% to 35% in 2005
Europe reduced summer RVP that reduced butane use
Lead Phase Out in Africa and South America**

Ethanol is a much less effective replacement octane because of its non-fungibility and its high RVP (21+RVP displaces low cost natural gasoline from summer gasoline)

Severe Octane Shortage will constrain summer gasoline supplies in 2006 and 2007. And 2008?

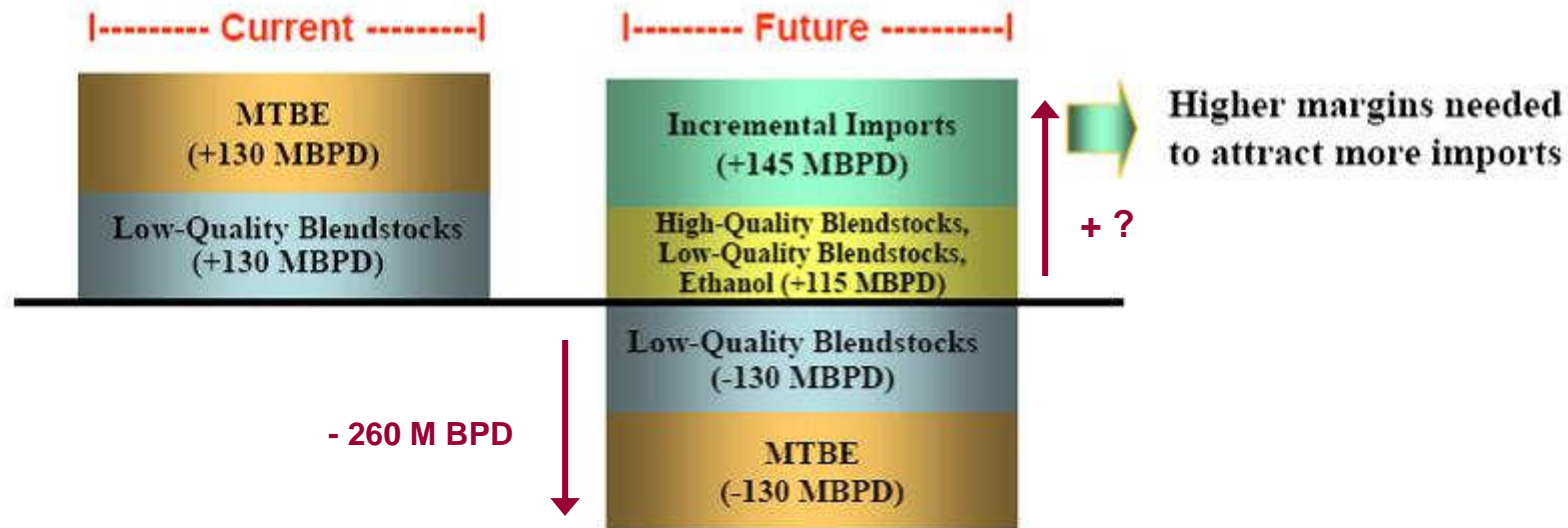
Refiners will consider reducing Premium Octane level from 93 to 91 (i.e. California 2004)

Valero Views at Lehman Brothers Energy Conference, Sept 7, 2005

2006 Expected to be Better than 2005

Challenging regulatory environment supports continuation of tight product markets in 2006

- ▶ Next phase of Tier II fuel specs may further limit supplies
- ▶ Enactment of Energy Bill - Potential loss of MTBE in U.S. gasoline pool

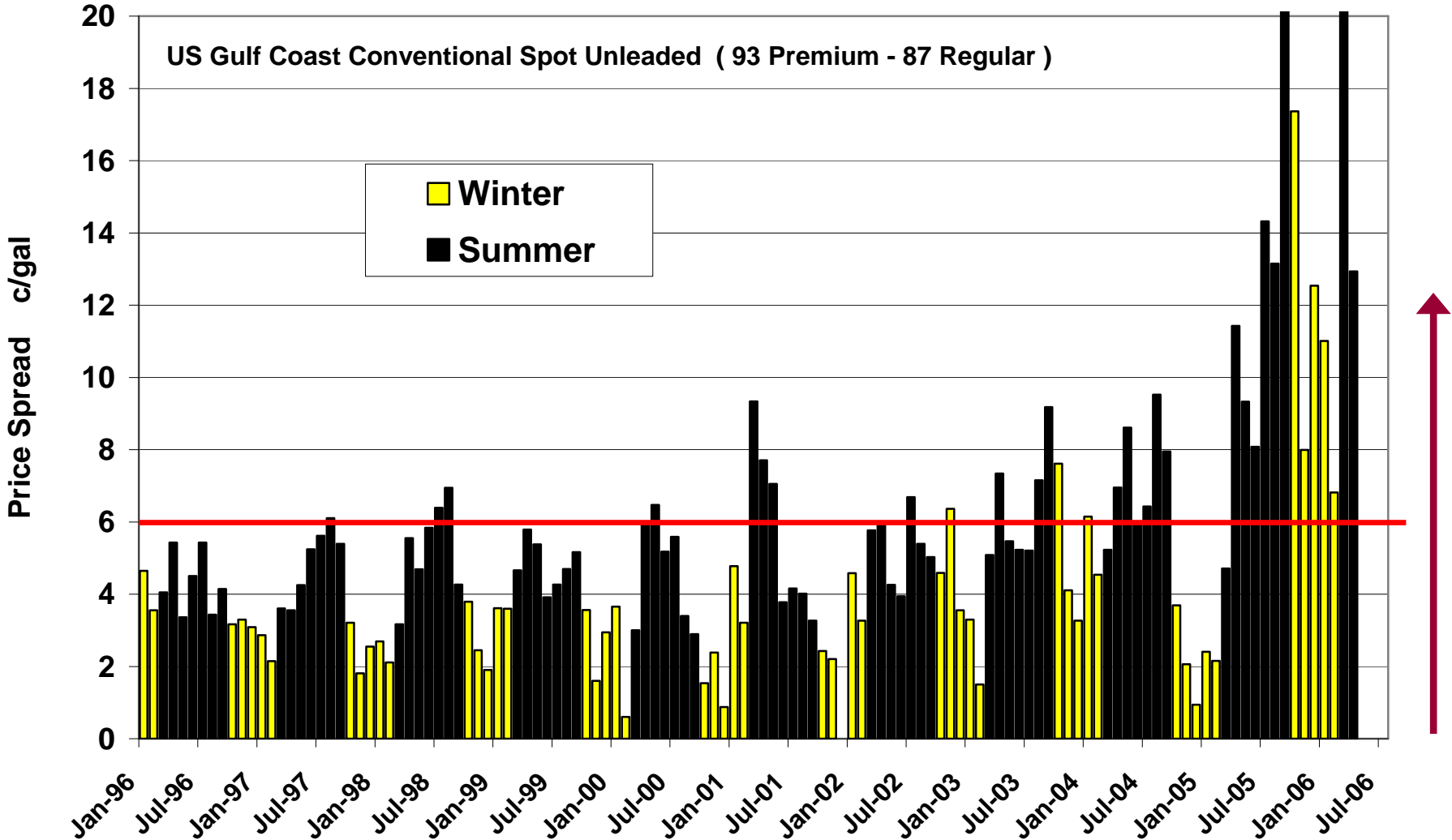


Where will the incremental Gasoline Imports come from? Is Europe maxed out?

Does transferring 115 M BPD of existing Ethanol from Mid-West gasoline supplies in 2006 increase or decrease total US summer gasoline supplies?

Will "net" summer gasoline loss from MTBE removal be closer to 400 M BPD?

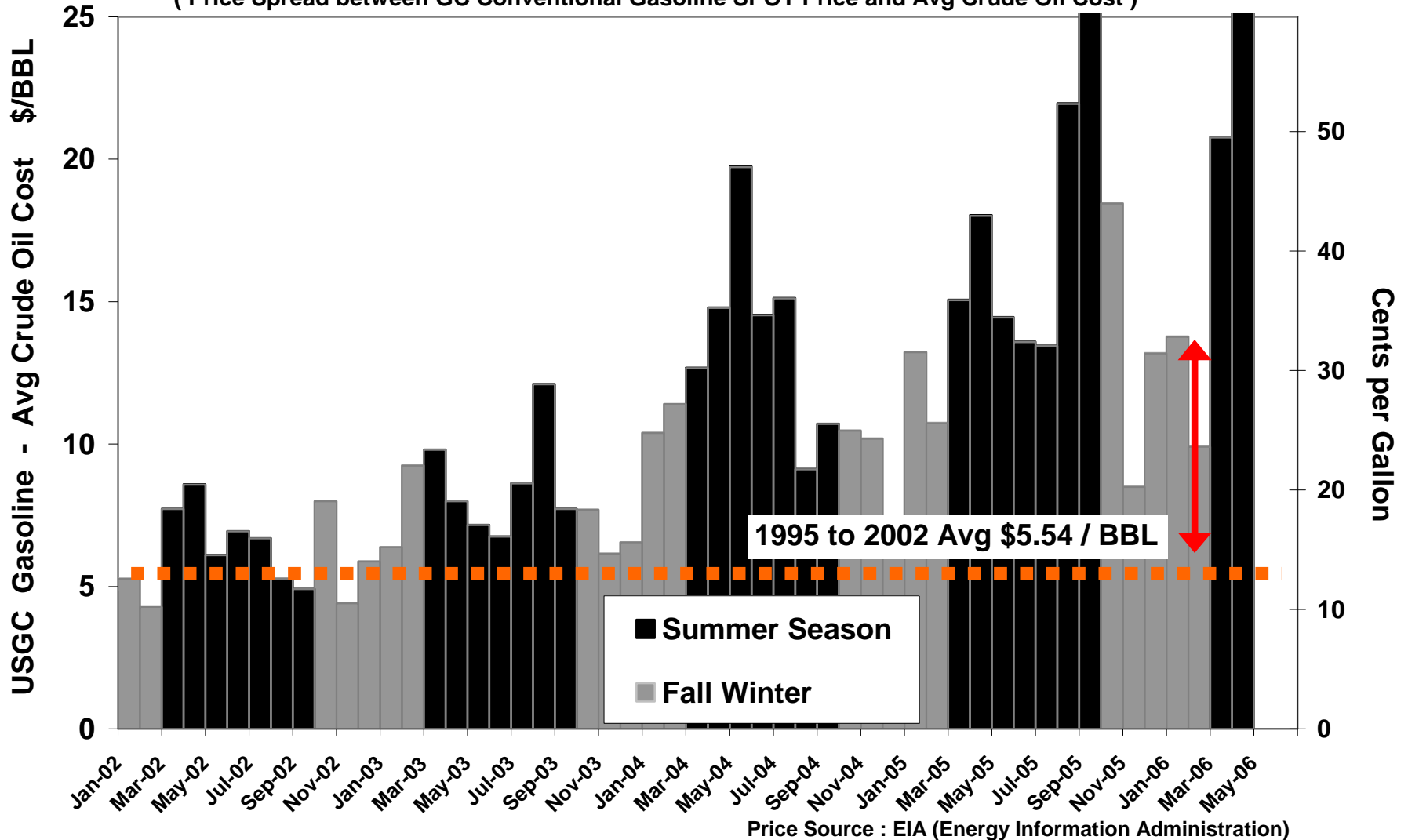
Premium Gasoline Price Spread Increasing Since 2003



Increasing Premium Price Spread indicates Major Octane Shortage

Refiner's Gasoline Gross Margin (Crack Spread) Growing Since 2003

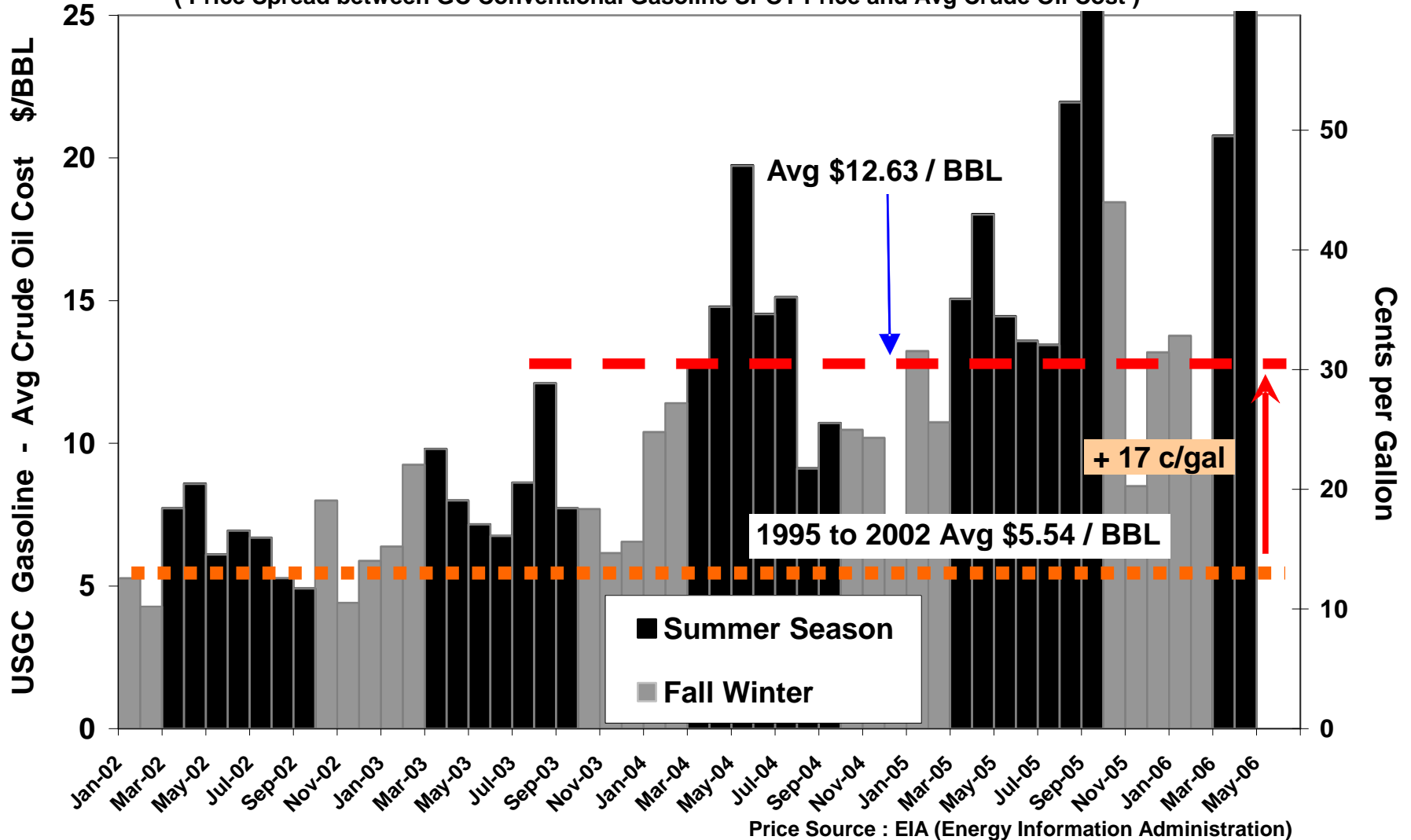
(Price Spread between GC Conventional Gasoline SPOT Price and Avg Crude Oil Cost)



High gasoline margins during winter indicate gasoline capacity is tight !

Refiner's Gasoline Gross Margin (Crack Spread) Growing Since 2003

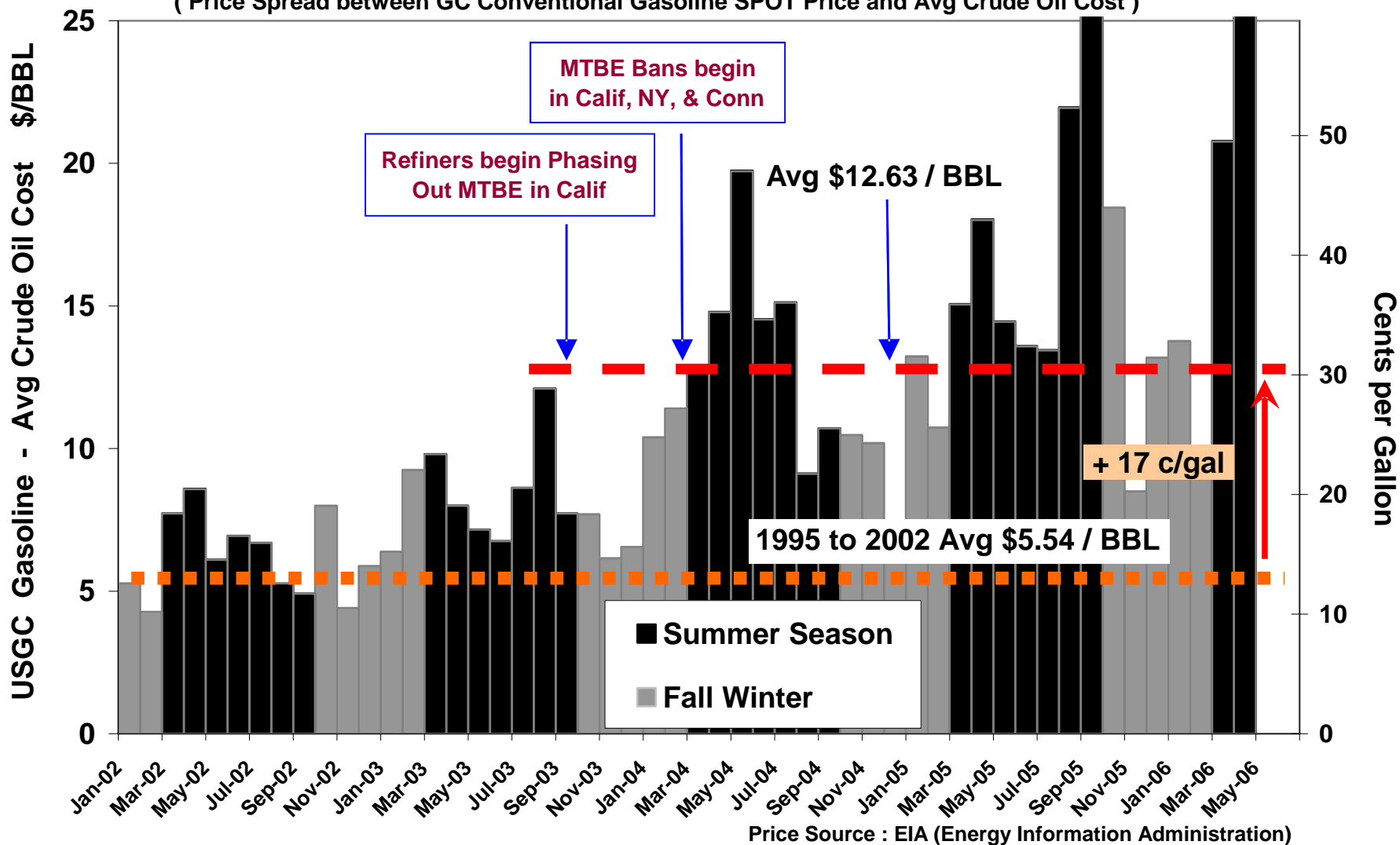
(Price Spread between GC Conventional Gasoline SPOT Price and Avg Crude Oil Cost)



What contributed to recent step improvement in refinery gross margins ?

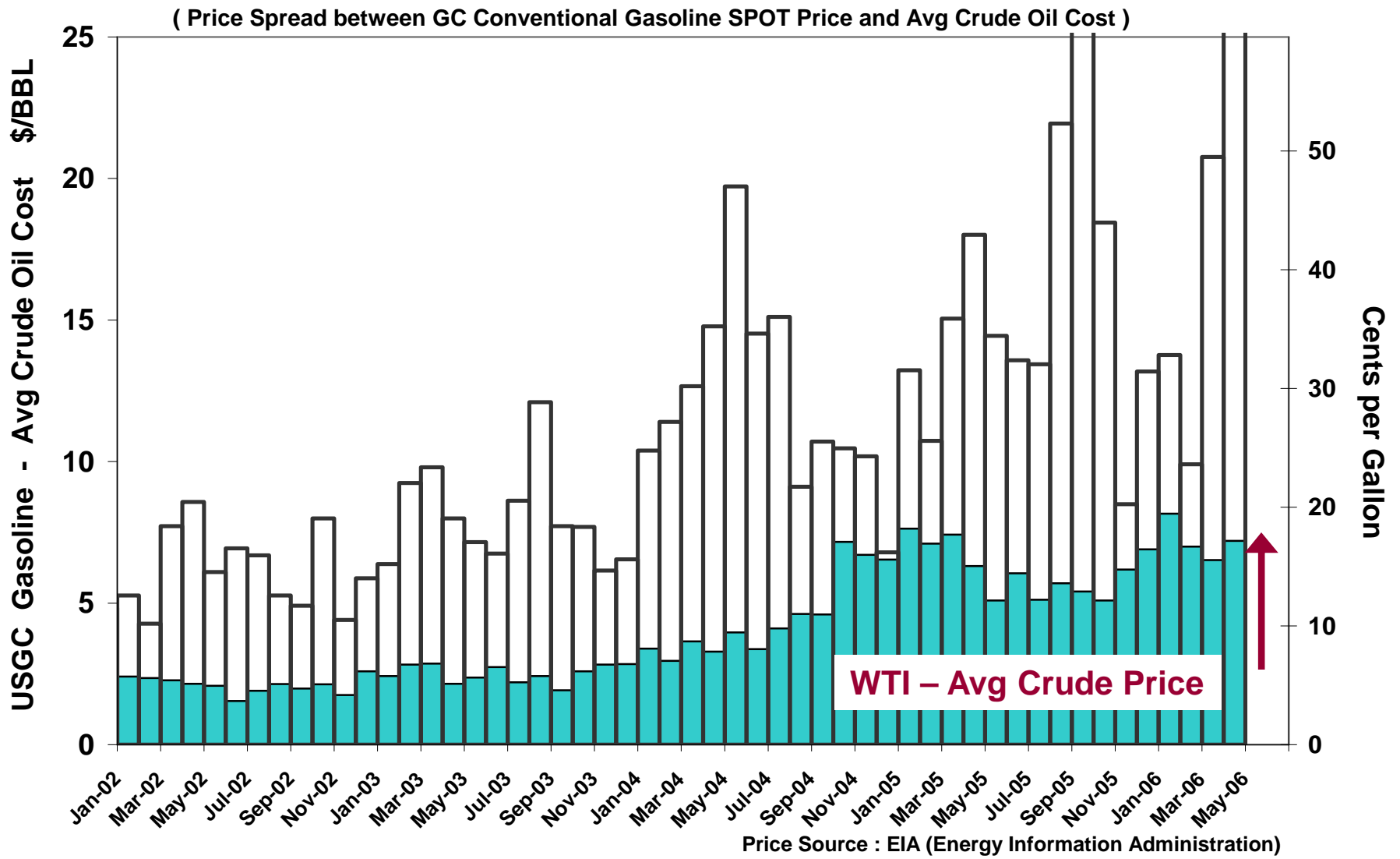
Refiner's Gasoline Gross Margin (Crack Spread) Growing Since 2003

(Price Spread between GC Conventional Gasoline SPOT Price and Avg Crude Oil Cost)



MTBE bans by Calif, NY & Conn reduced US gasoline capability by ~ 300 M BPD

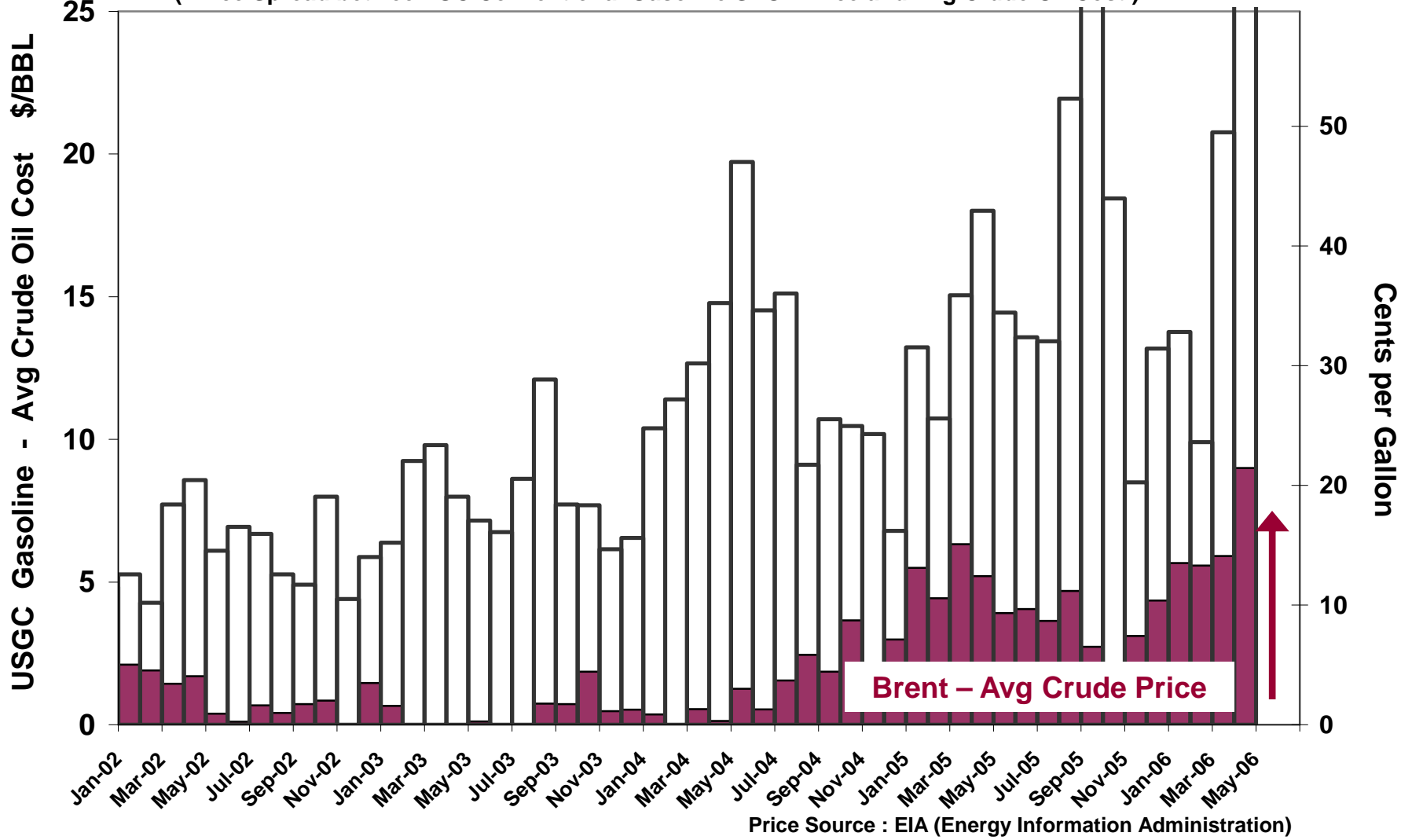
Increasing WTI “Price Spread” Masking Growing Refinery Gross Margins



Growing Price Spread of WTI - Avg Crude indicates US gasoline capacity is constrained

Increasing **Brent** “Price Spread” Suggests Constrained EU Refinery Capacity

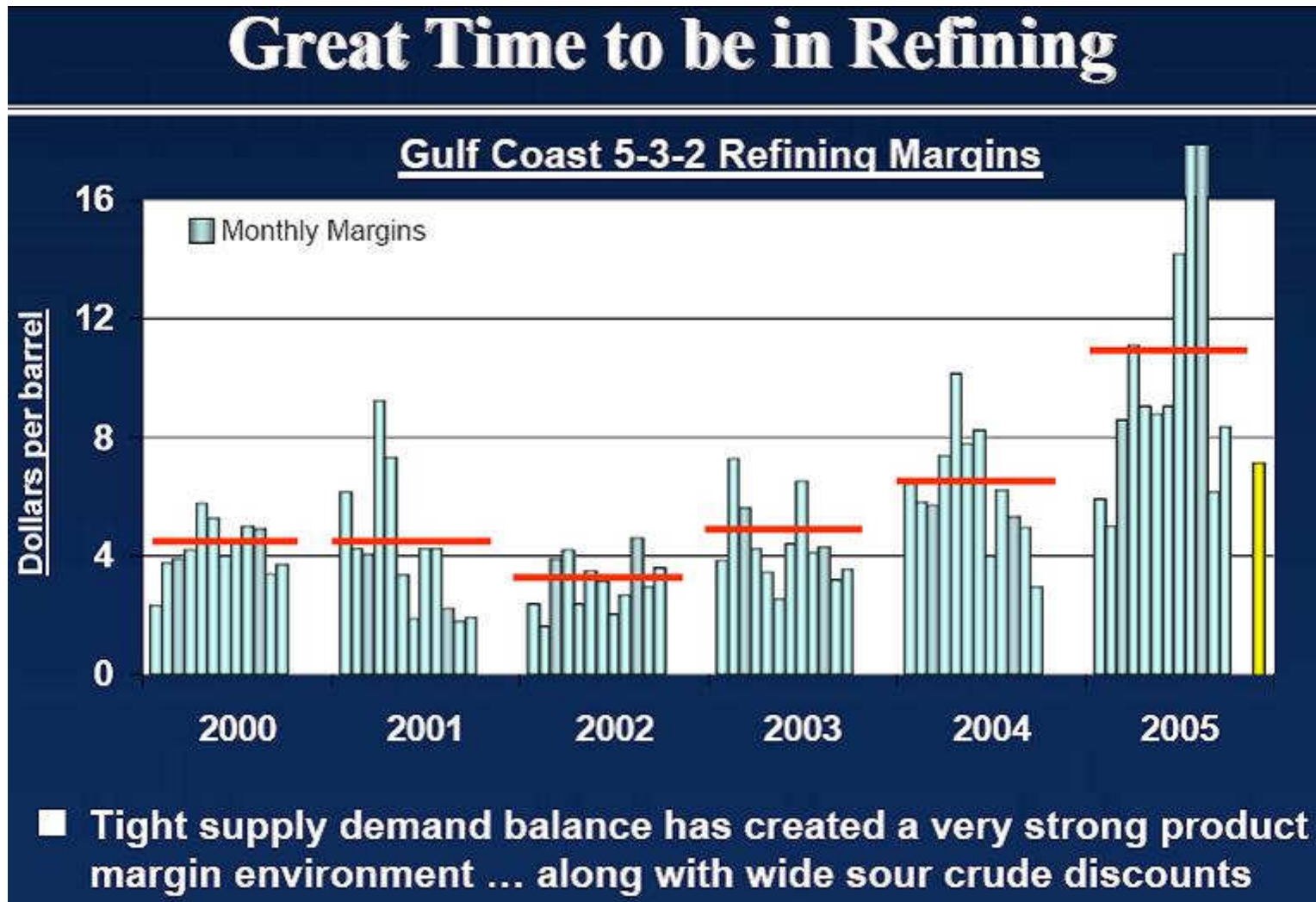
(Price Spread between GC Conventional Gasoline SPOT Price and Avg Crude Oil Cost)



Price Source : EIA (Energy Information Administration)

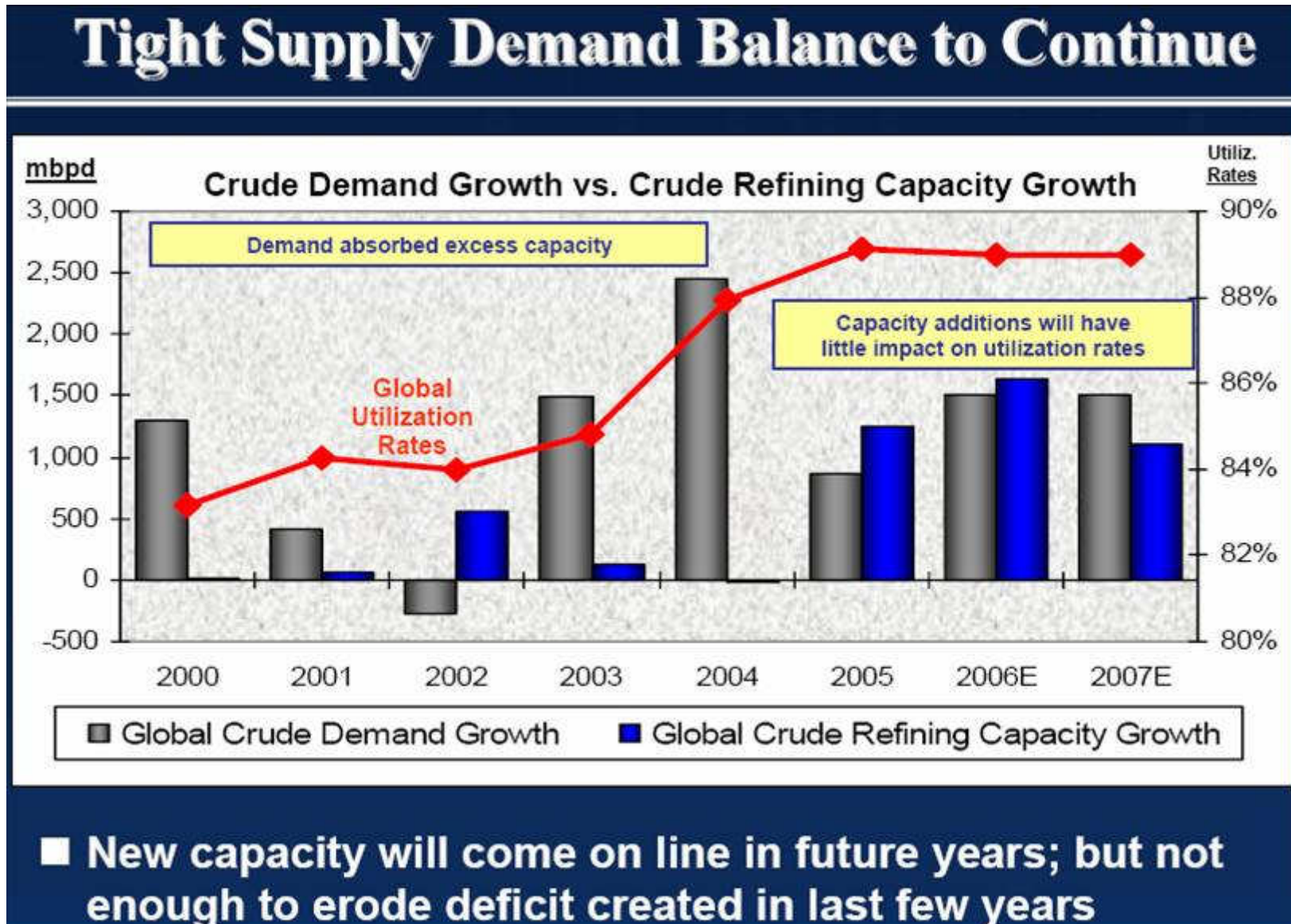
Growing Price Spread of Brent - Avg Crude indicates EU gasoline capacity is constrained

Valero Views at Scotia Capital Global Energy Summit 2006 Feb 14 2006



Note: Refining Margins based on WTI understate True Refiner Gross Margins

Valero Views at Scotia Capital Global Energy Summit 2006 Feb 14 2006



Note: World Gasoline / Octane Capability not growing as fast as crude capacity

How Bad Can It Get? Ugly !

- Excess Octane Capacity in Atlantic Basin is Shrinking from Environmental Regulations

Constraining Summer Gasoline Supplies !

Driving marginal Gasoline Prices Higher !

- Higher Gasoline Values increasing WTI and Brent Price Spreads Over Average Crude Prices (\$5 to \$8 premium)
- Traditional Market Indicators are not working effectively
i.e. “Gas - WTI” Crk Sprd, physical inventories, & crude capacity
- US exporting MTBE into Atlantic Basin Market for Octane and Gasoline
- Ethanol is not very effective for expanding octane capability or summer gasoline supplies



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