

# Energy Markets Outlook

March 2006

Chicago

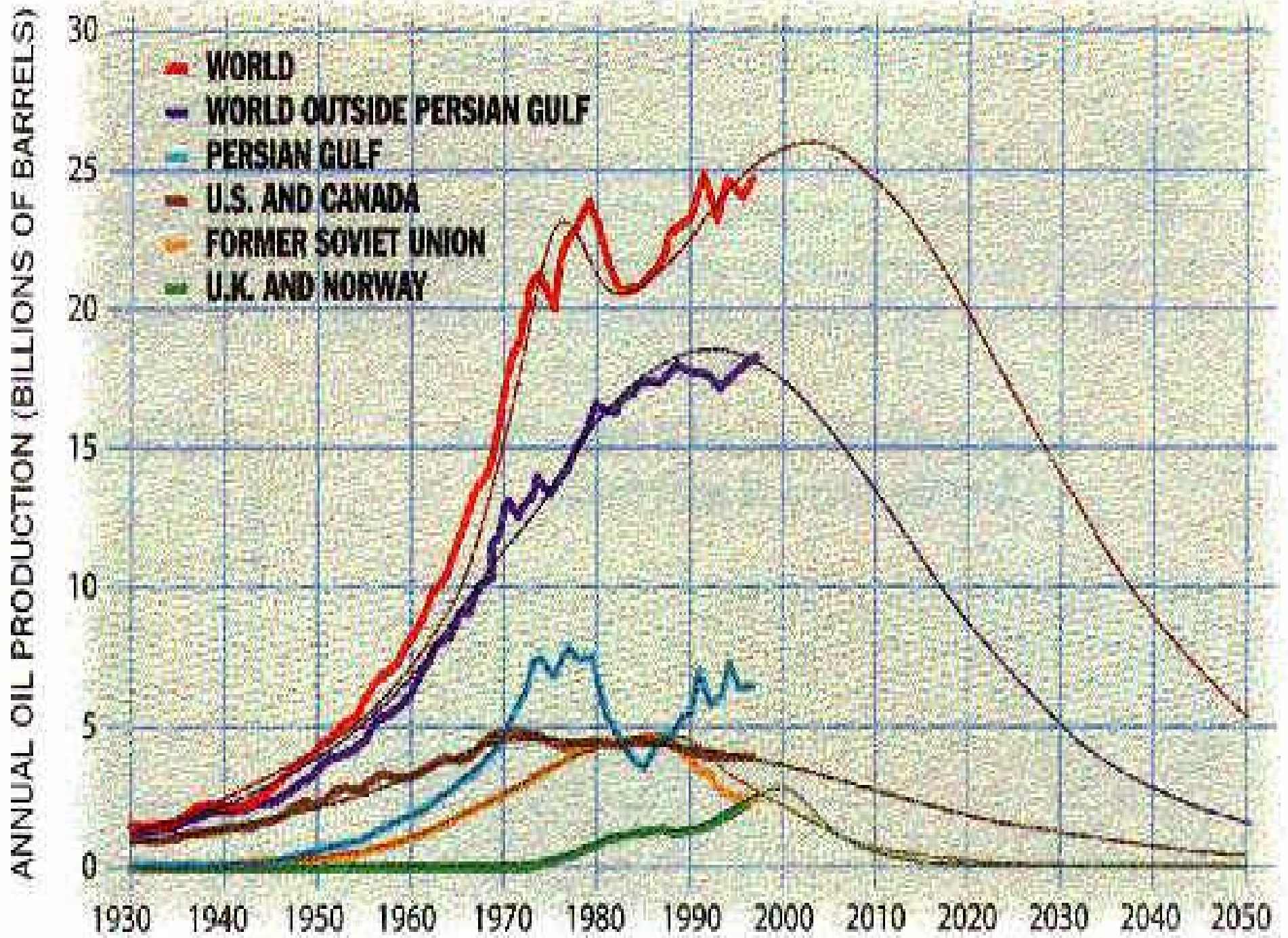
GSC

## Mch 04 - 05/06 Medium Price Case

- global economy is stable
- summer and winter are normal
- OPEC maintains production
- dollar stabilizes
- no event shocks
- crude is \$42-55
- #2 oil is \$1.10-1.50
- gasoline is \$1.15-1.60
- natural gas is \$6-9
- propane is 70-1.05

# Mch 05 - 05/06 High Price Case

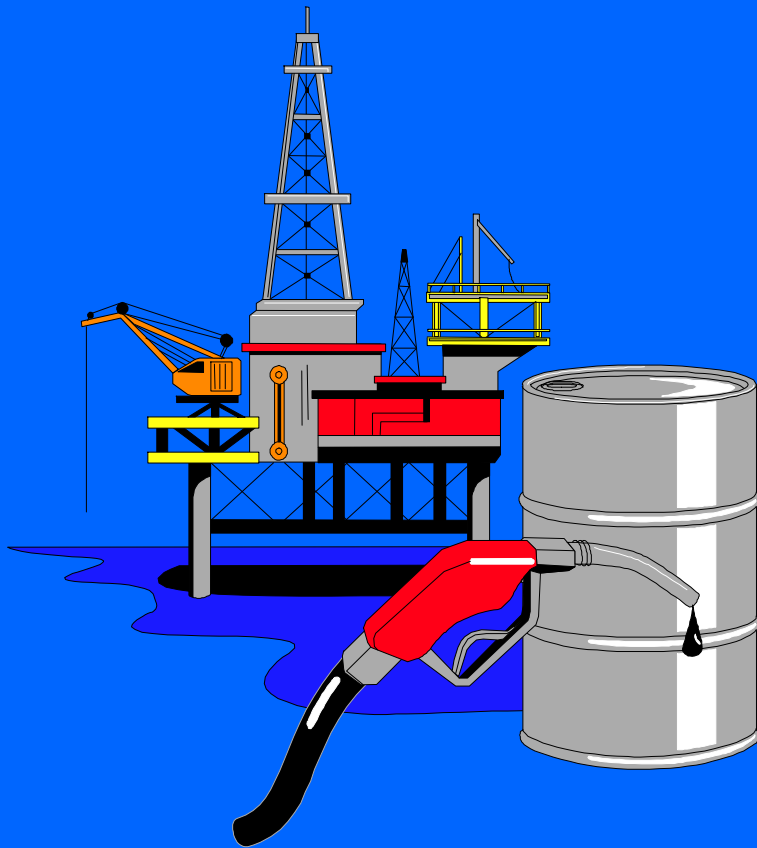
- global economy is strong
- hot summer followed by cold winter
- mideast turmoil intensifies
- dollar weakens further
- supply interruptions in Venezuela and Nigeria, plus OPEC production cuts
- crude is \$55-70
- HO is \$1.50-1.90
- gasoline is \$1.50-2.00
- Natural gas is \$8.00-11.00
- Propane is \$.75-1.30



# Crude Price History



# Drivers Behind Crude Price Increases



- Tight markets
- Little spare crude oil capacity
- Index funds



# GLOBAL MARKET ISSUES

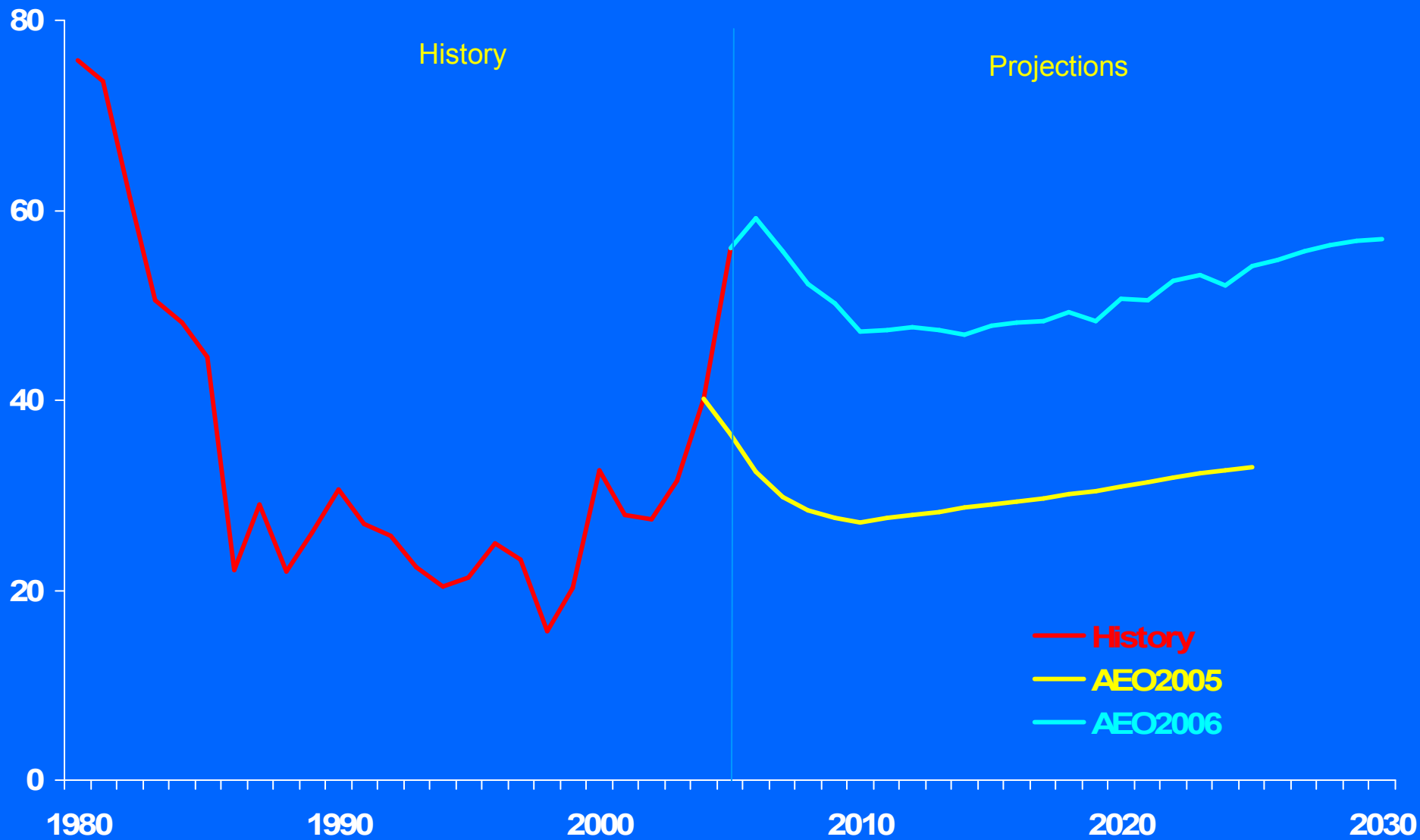
---

- Developing countries are demanding more energy, food and raw materials.
- Commodity prices have surged.
- U.S. is struggling to finance war and tax cuts - deficits are huge...and now Katrina and Rita.
- Higher interest rates (and inflation?) ahead.
- Mideast crisis and turmoil continues.
- Global economic outlook is uncertain.

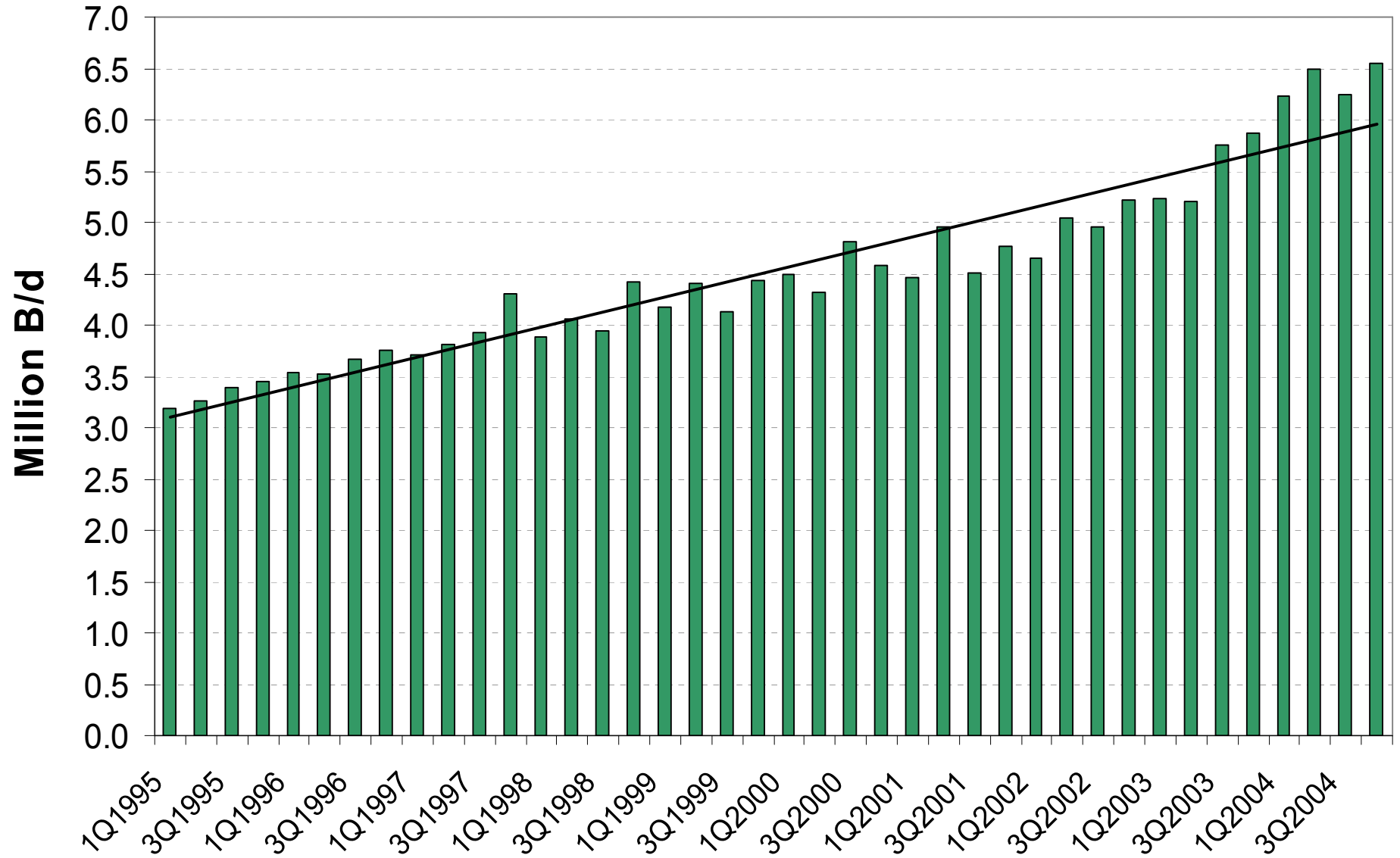
## **EIA Has Reassessed Its Long-Term Oil Price Projection**

- Major oil producing countries pace investment more consistent with higher oil price path
- Investment impediments more persistent, even after several years of relatively high oil prices
- Cost of doing business increasing
- Not due to “Peak Oil” considerations, although we are following this issue closely

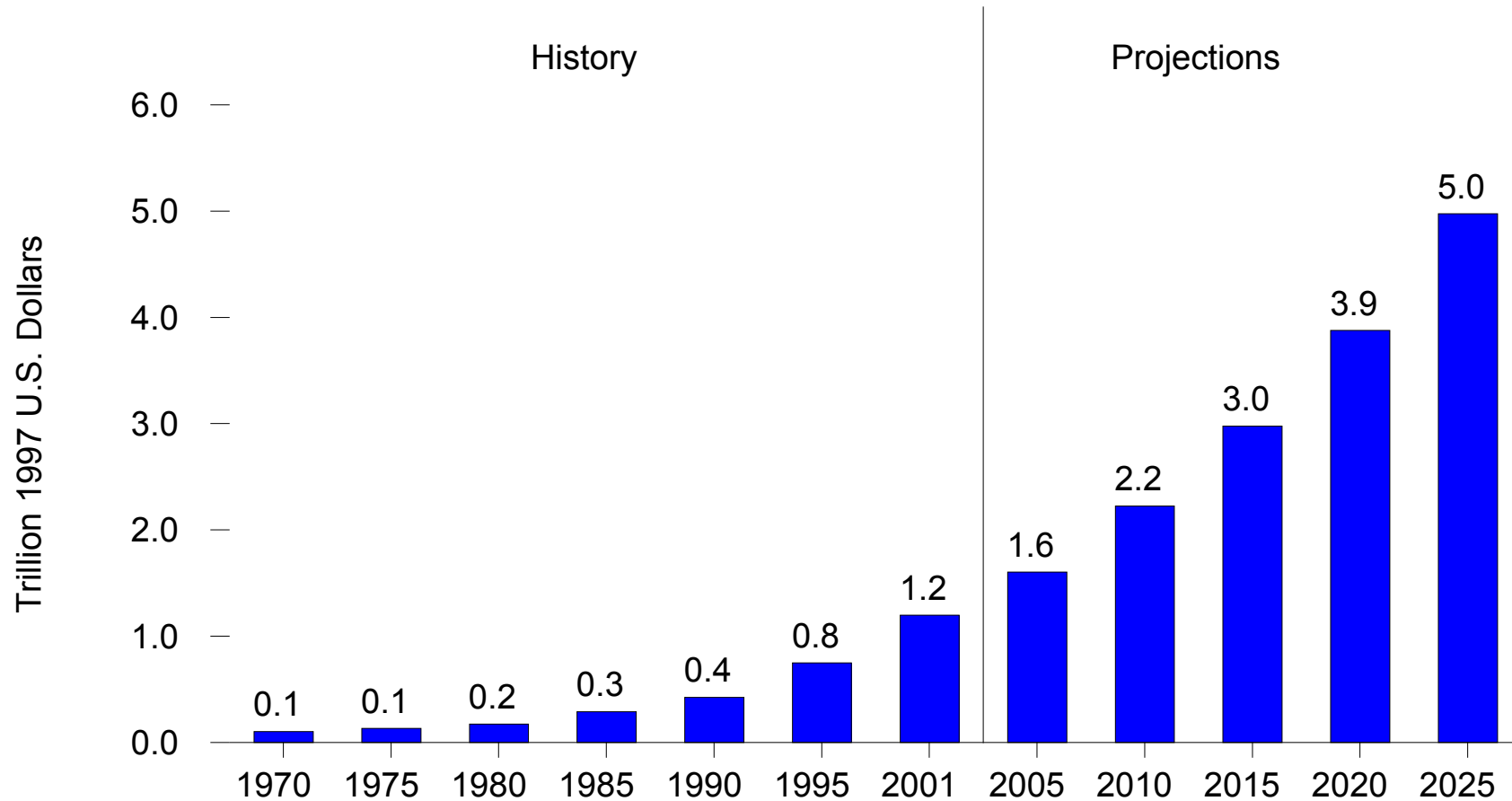
# World Oil Price, 1980-2030 (2004 dollars per barrel)



# Chinese Oil Demand

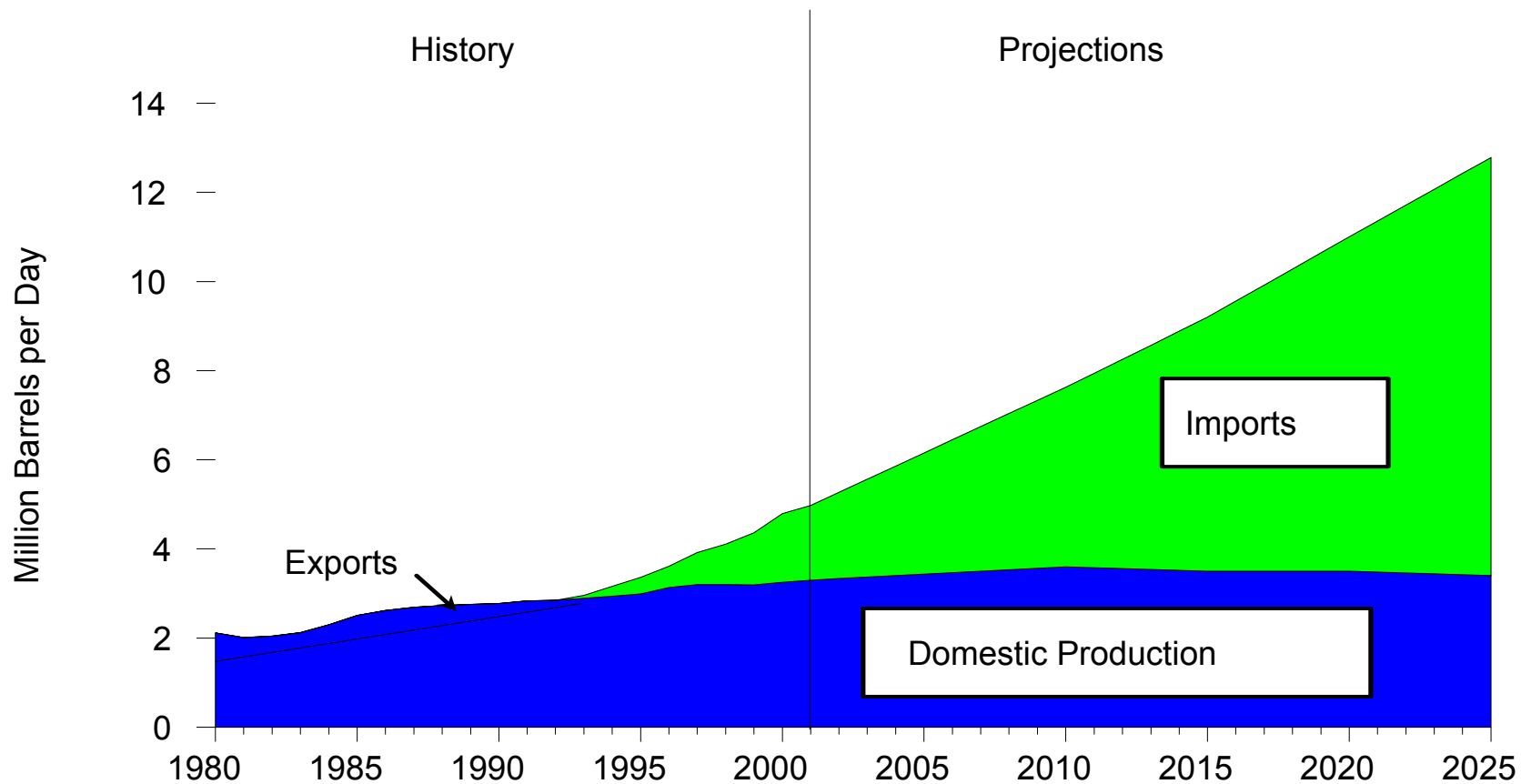


# GDP in China, 1970-2025



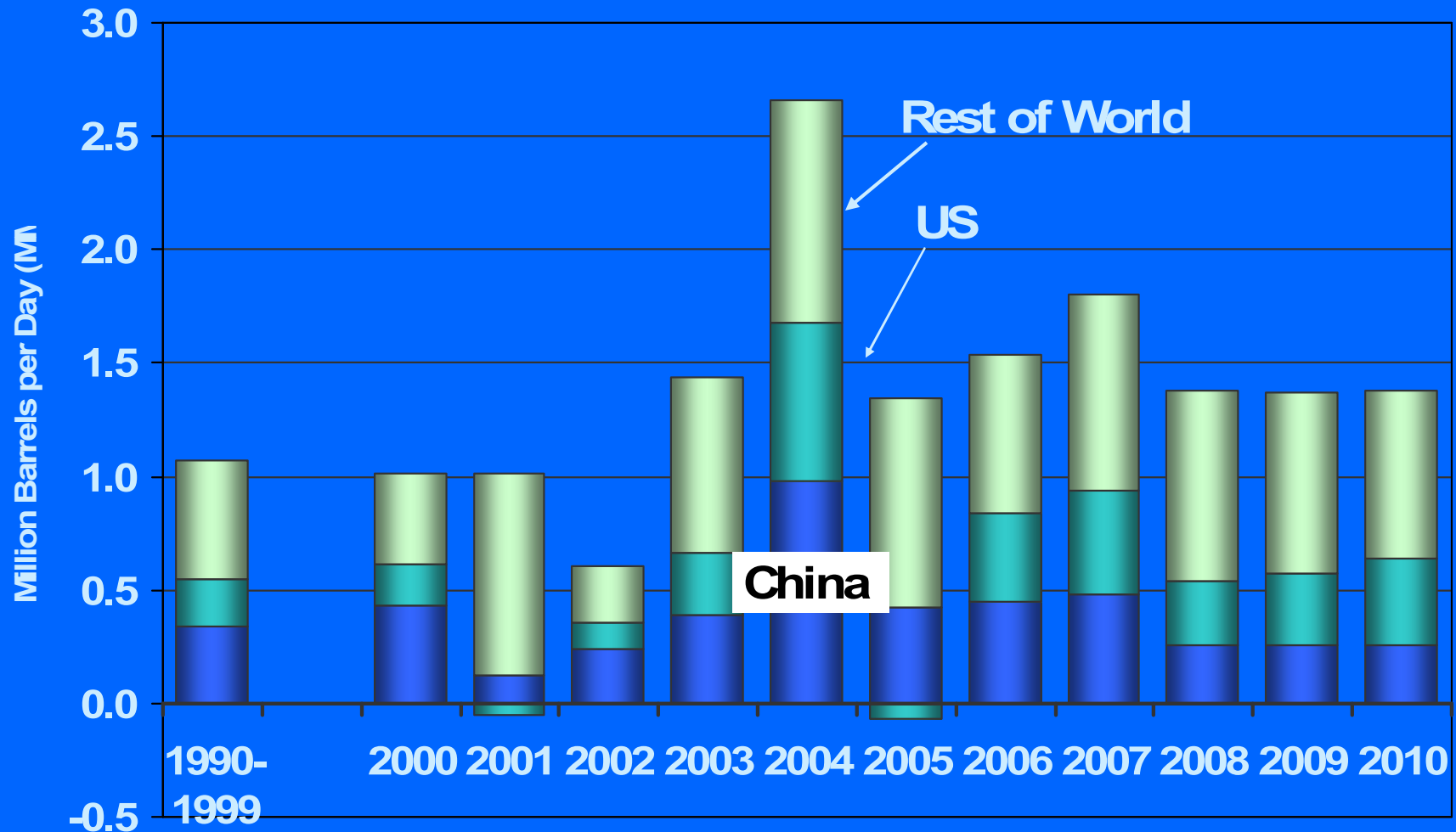
Source: EIA, *International Energy Outlook 2004*

# China's Oil Balance



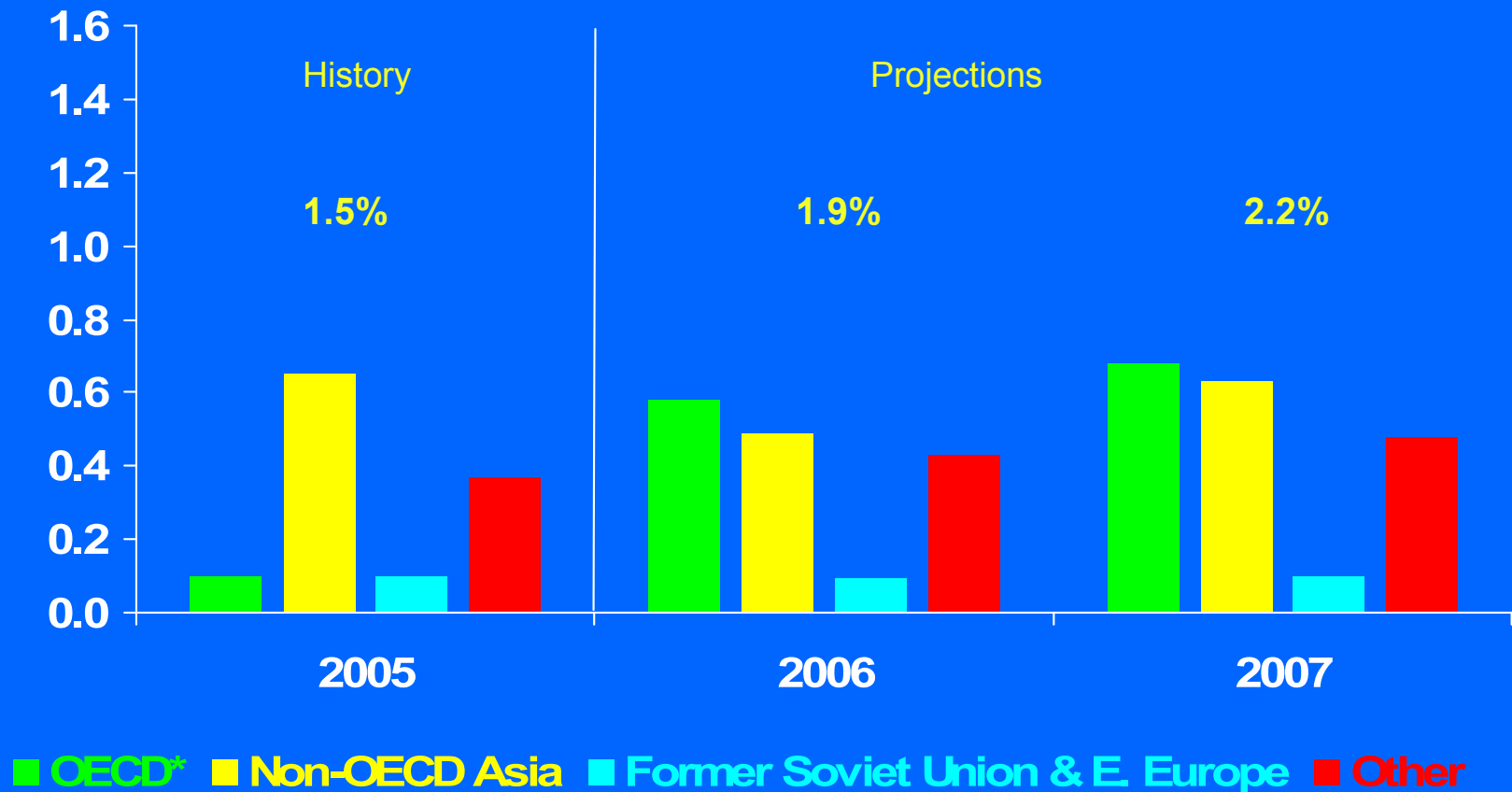
Source: EIA, *International Energy Outlook 2004*

# *World oil demand growth slowed in 2005: we expect it to increase through 2010*



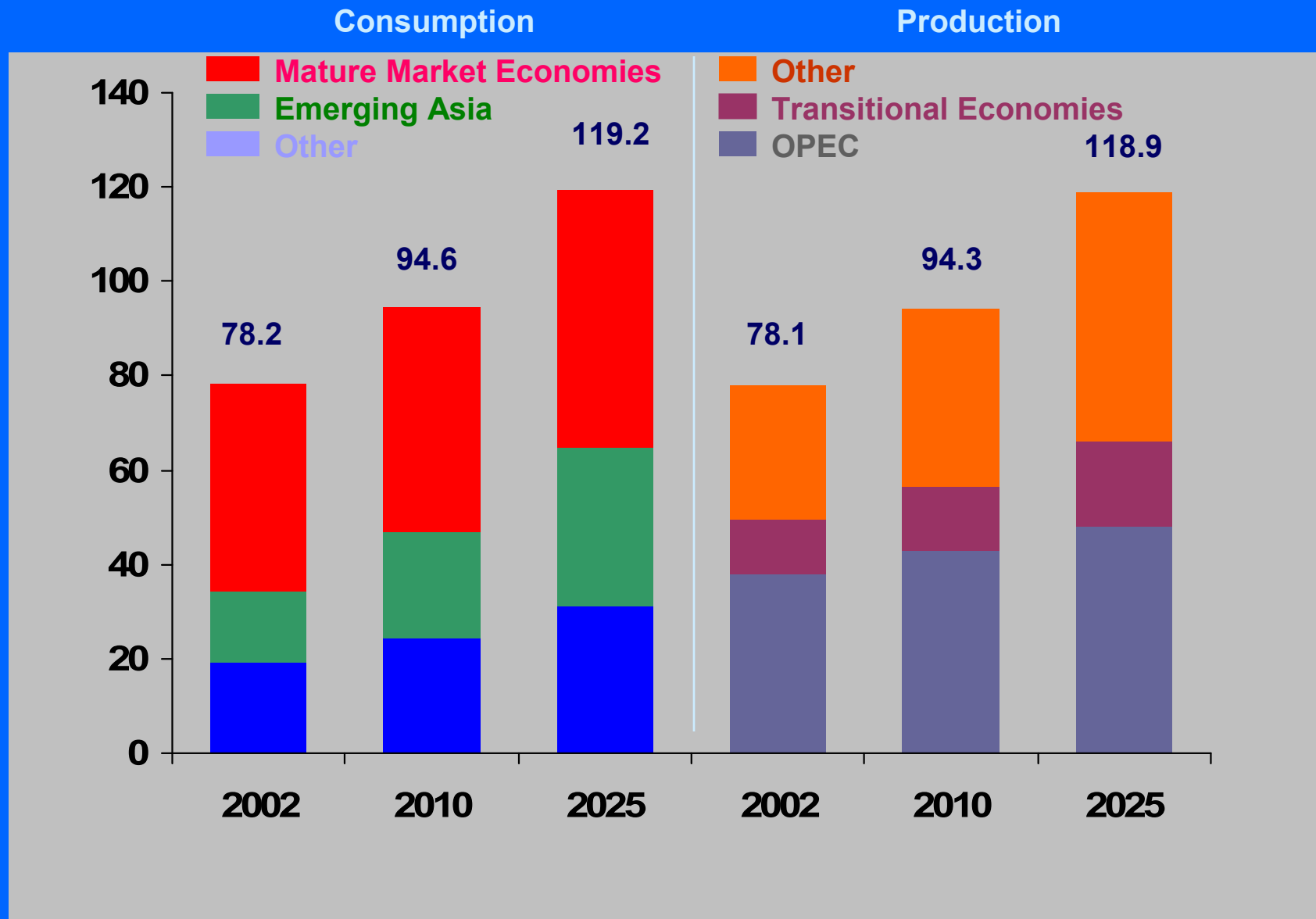
Source: EIA. *Short-term Energy Outlook*, February 2006. *Annual Energy Outlook*, 2006.

## World Oil Demand Growth (million barrels per day)

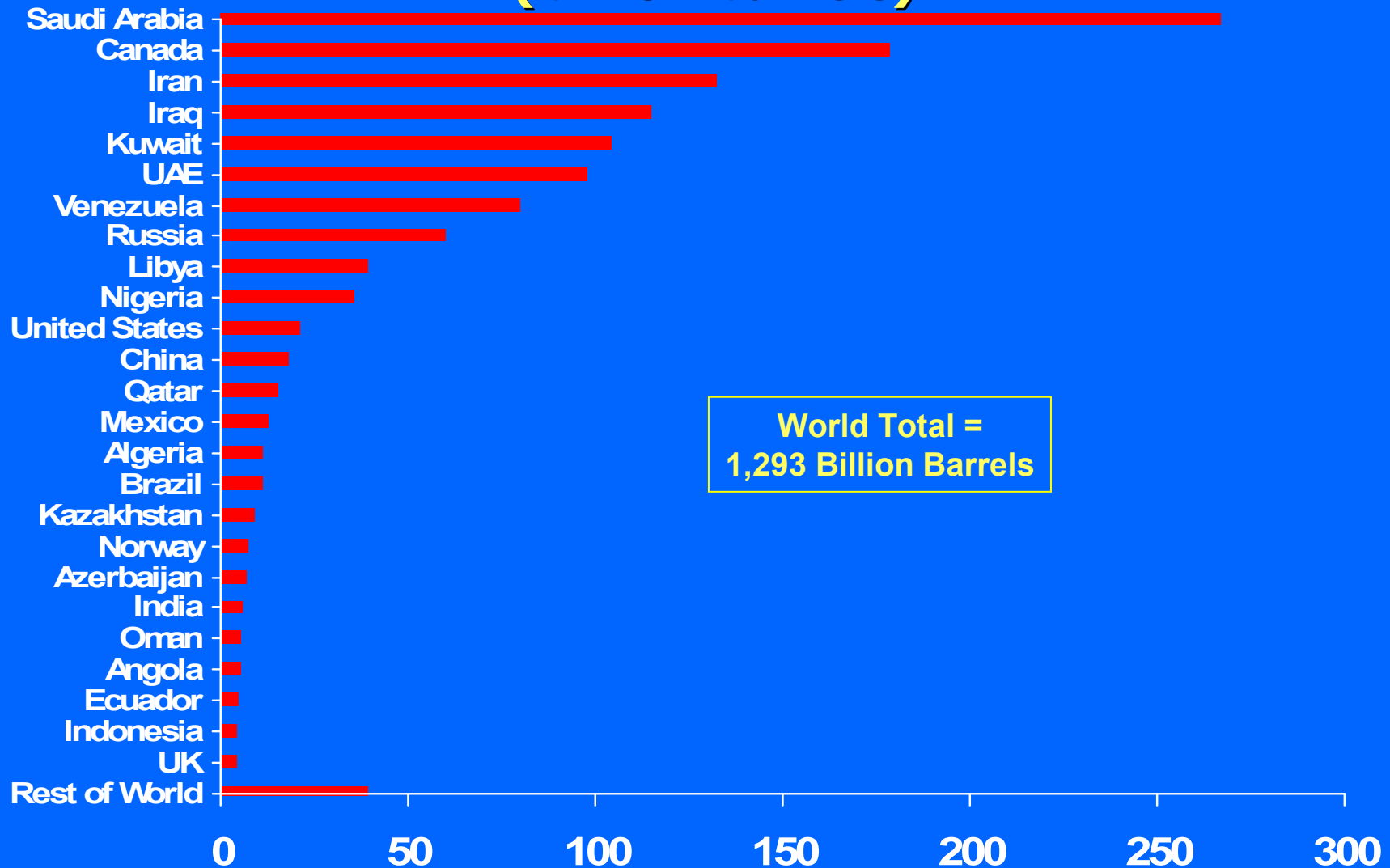


\*Organization of Economic Cooperation and Development

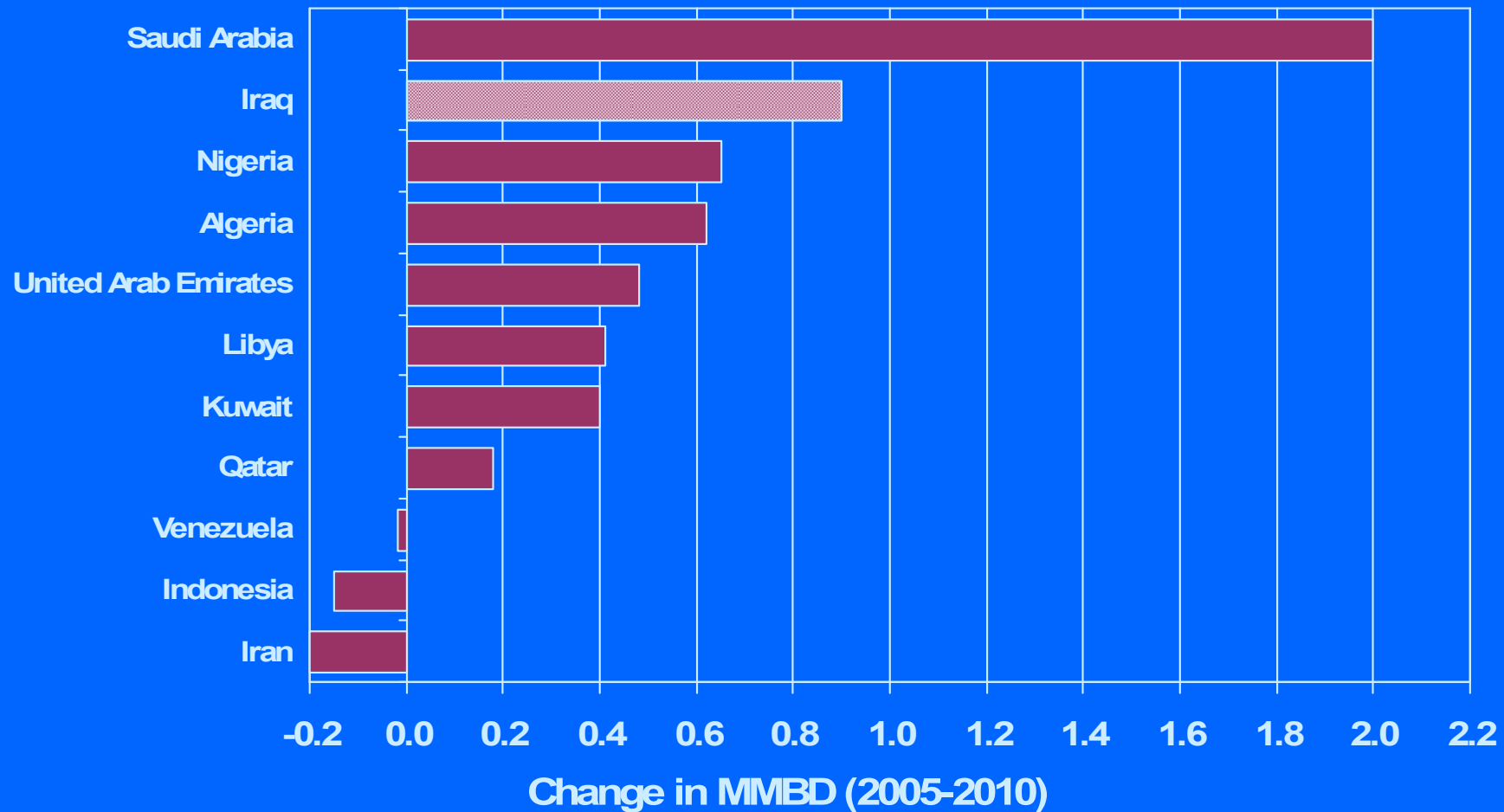
# World Oil Consumption and Production, 2002, 2010, and 2025 (million barrels per day)



# World Oil Reserves by Country, as of January 1, 2006 (billion barrels)



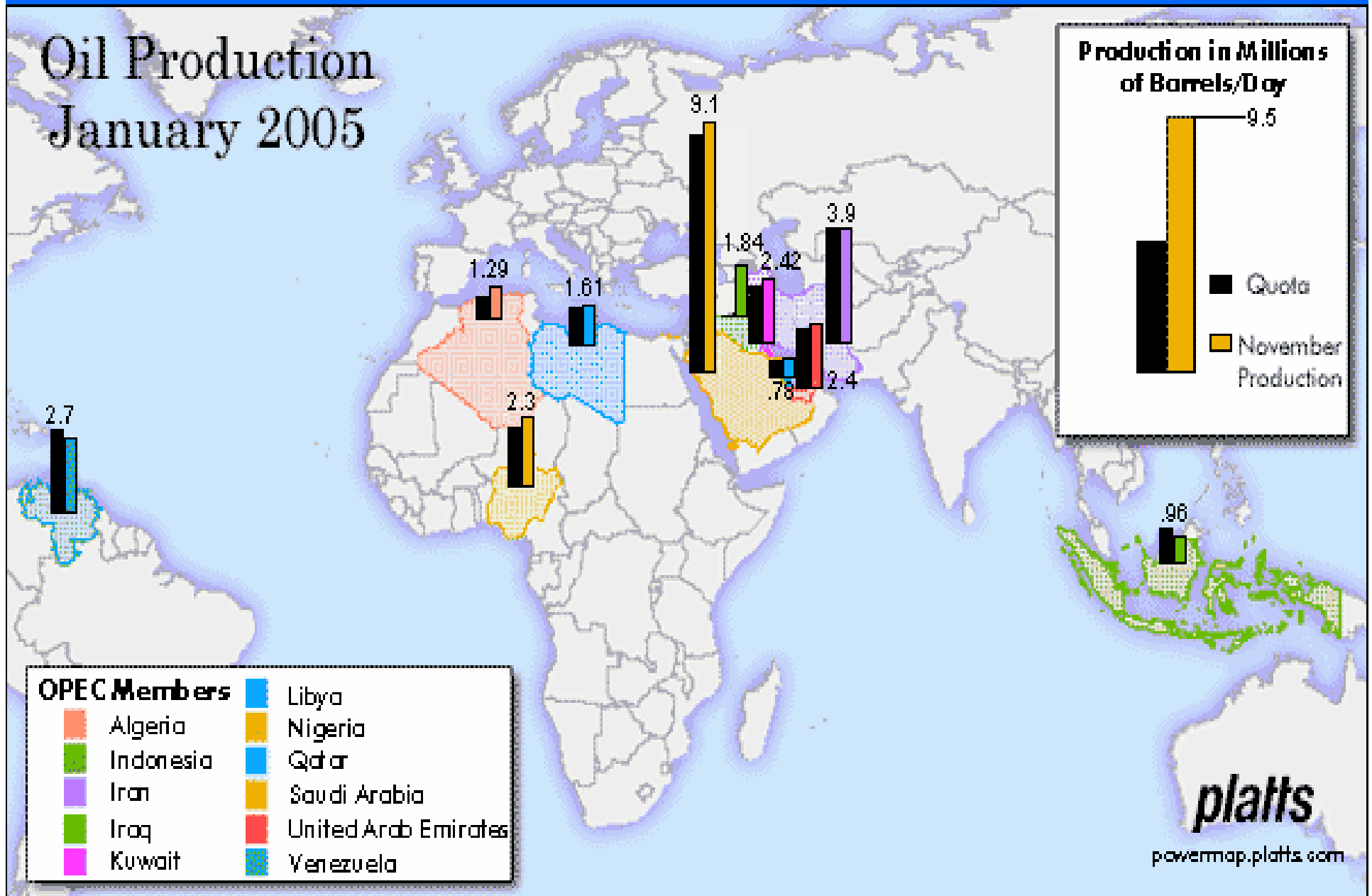
# *OPEC crude oil production capacity could grow 4-5 MMBD through 2010*



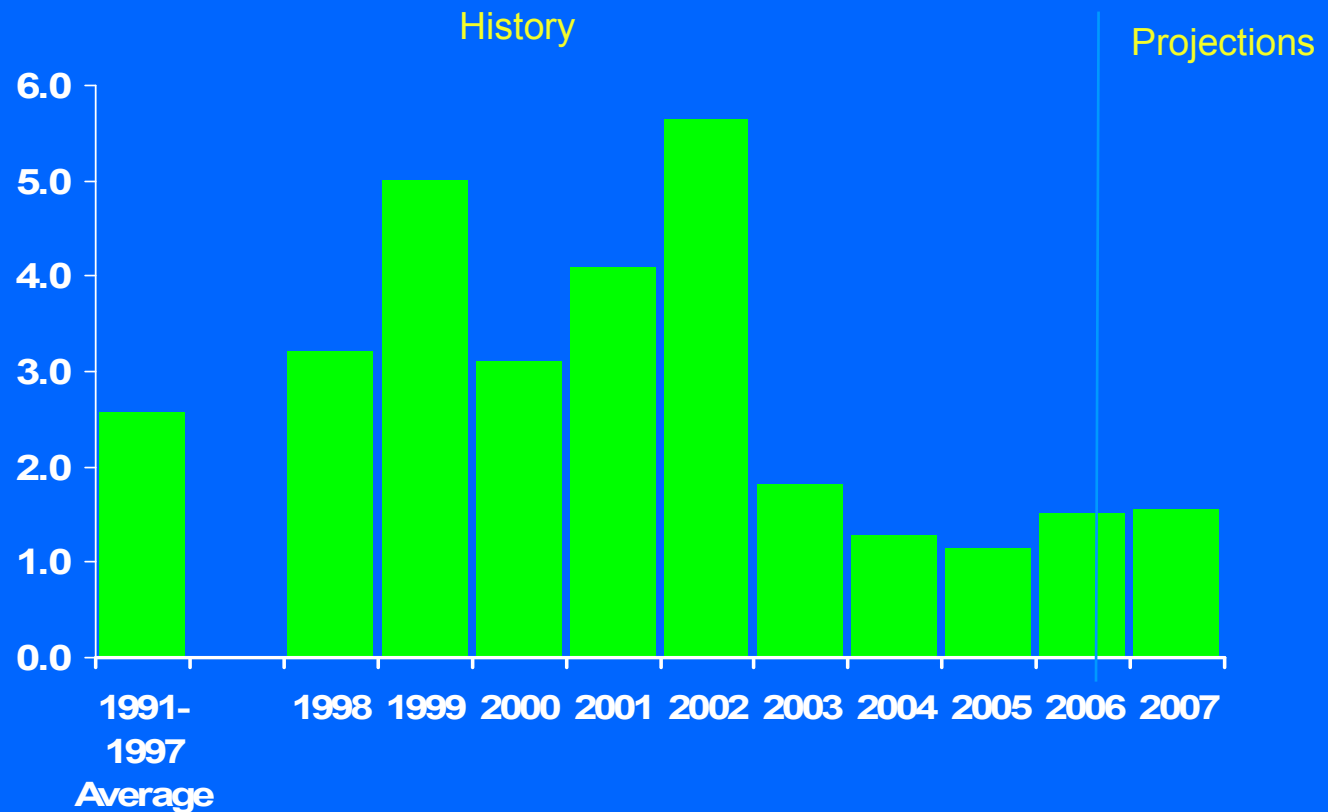
\* Iraqi capacity increases are highly uncertain because of political and security issues

Source: EIA internal estimates

# Oil Production January 2005



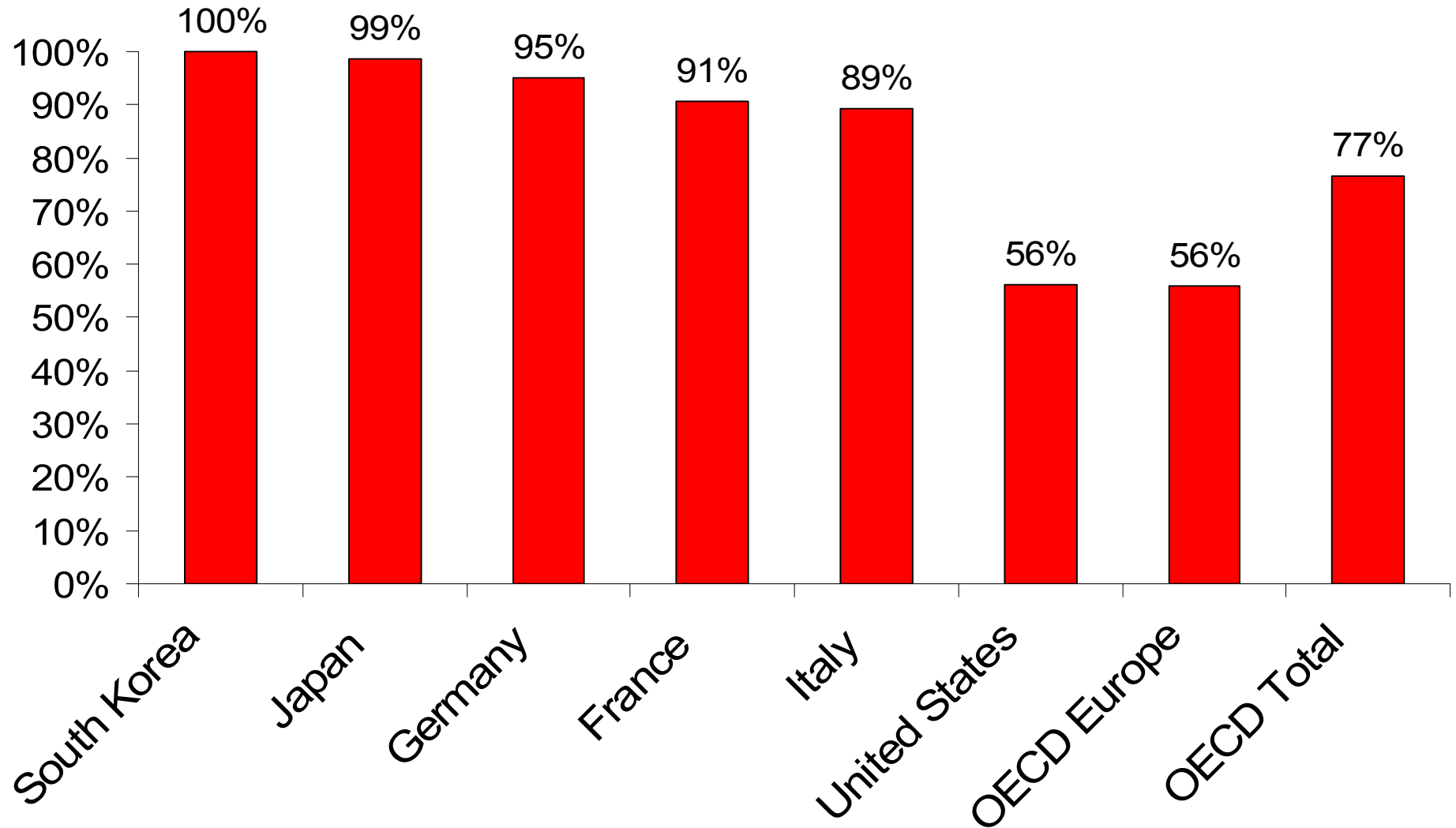
# World Oil Spare Production Capacity (million barrels per day)



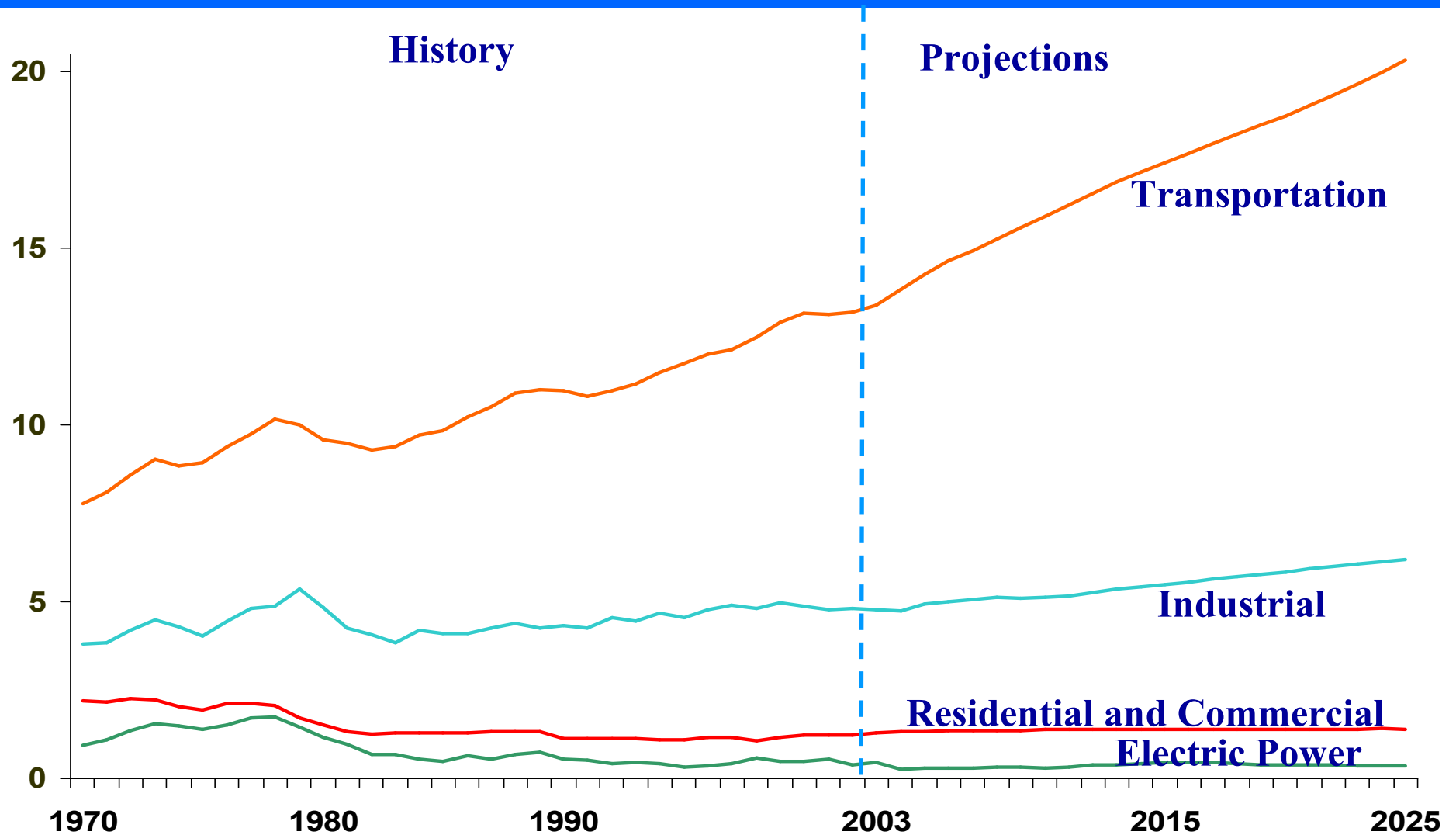
# The Big Questions

- Can OPEC (and Russia) increase production by 40 mbd over the next 20 years?
- Even if they could, would they want to?
- What if they can't do it?
- How will the supply be rationed?

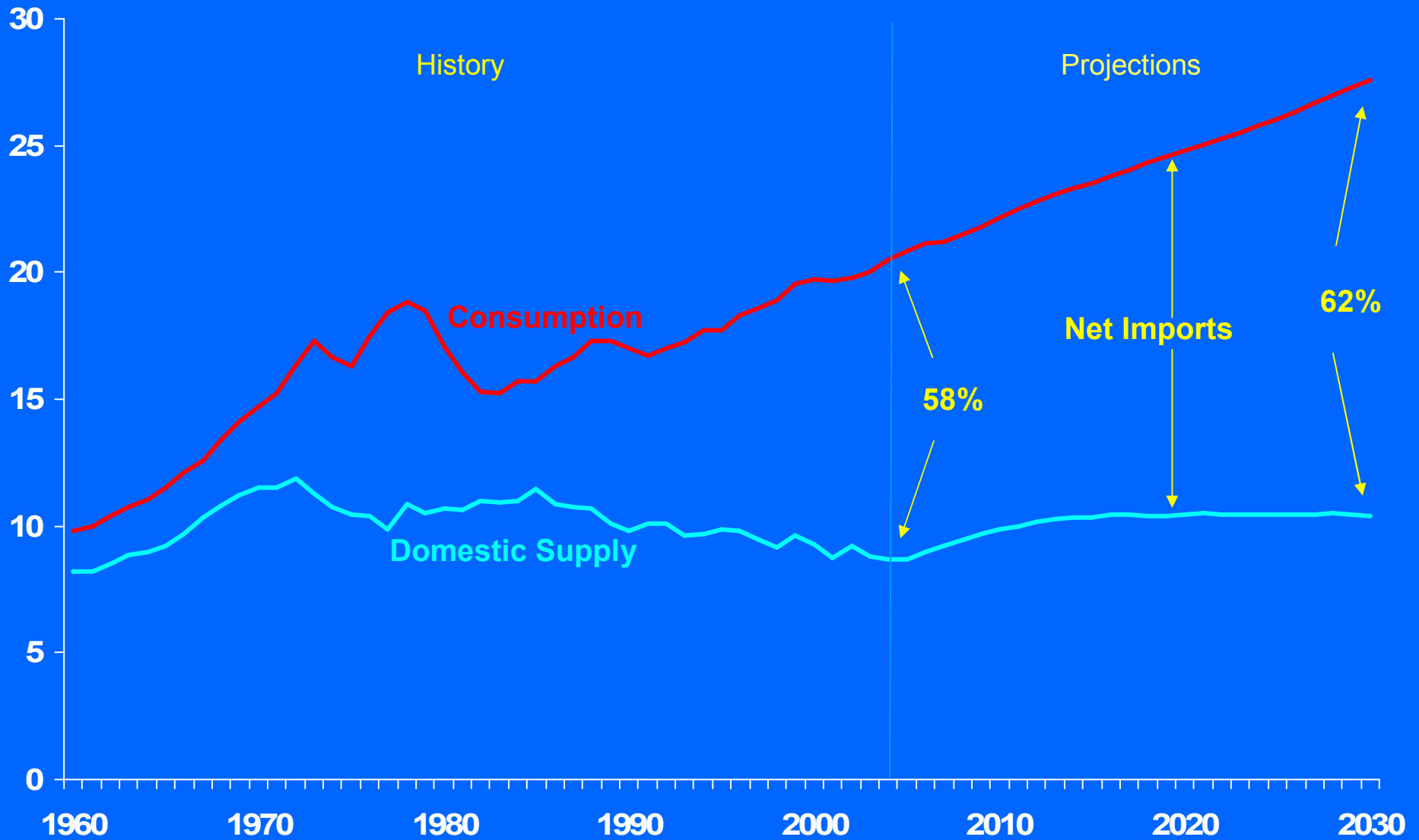
# Oil Import Dependence for Selected OECD Countries, 2003



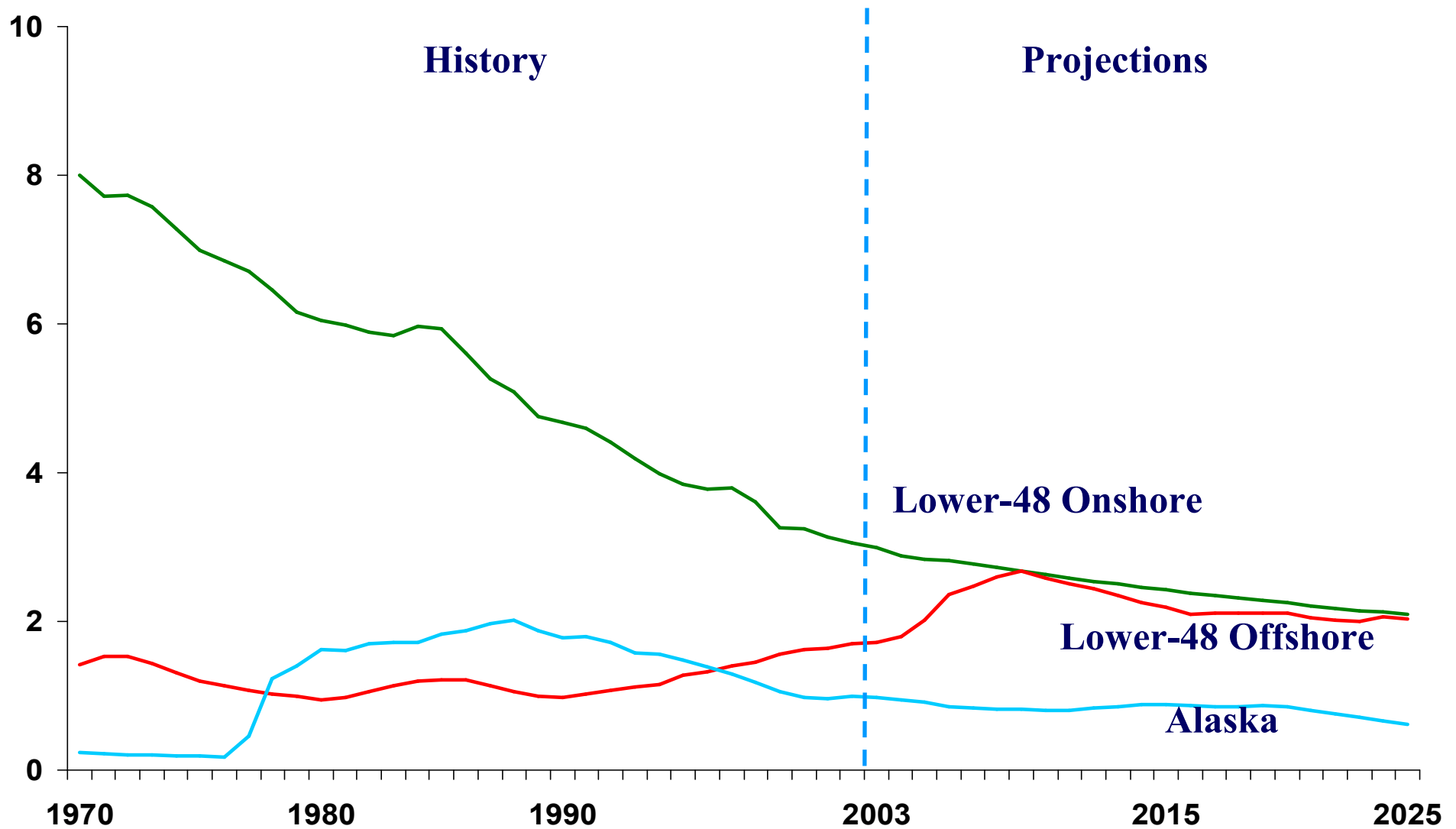
# U.S. Petroleum Consumption by Sector, 1970-2025 (million barrels per day)



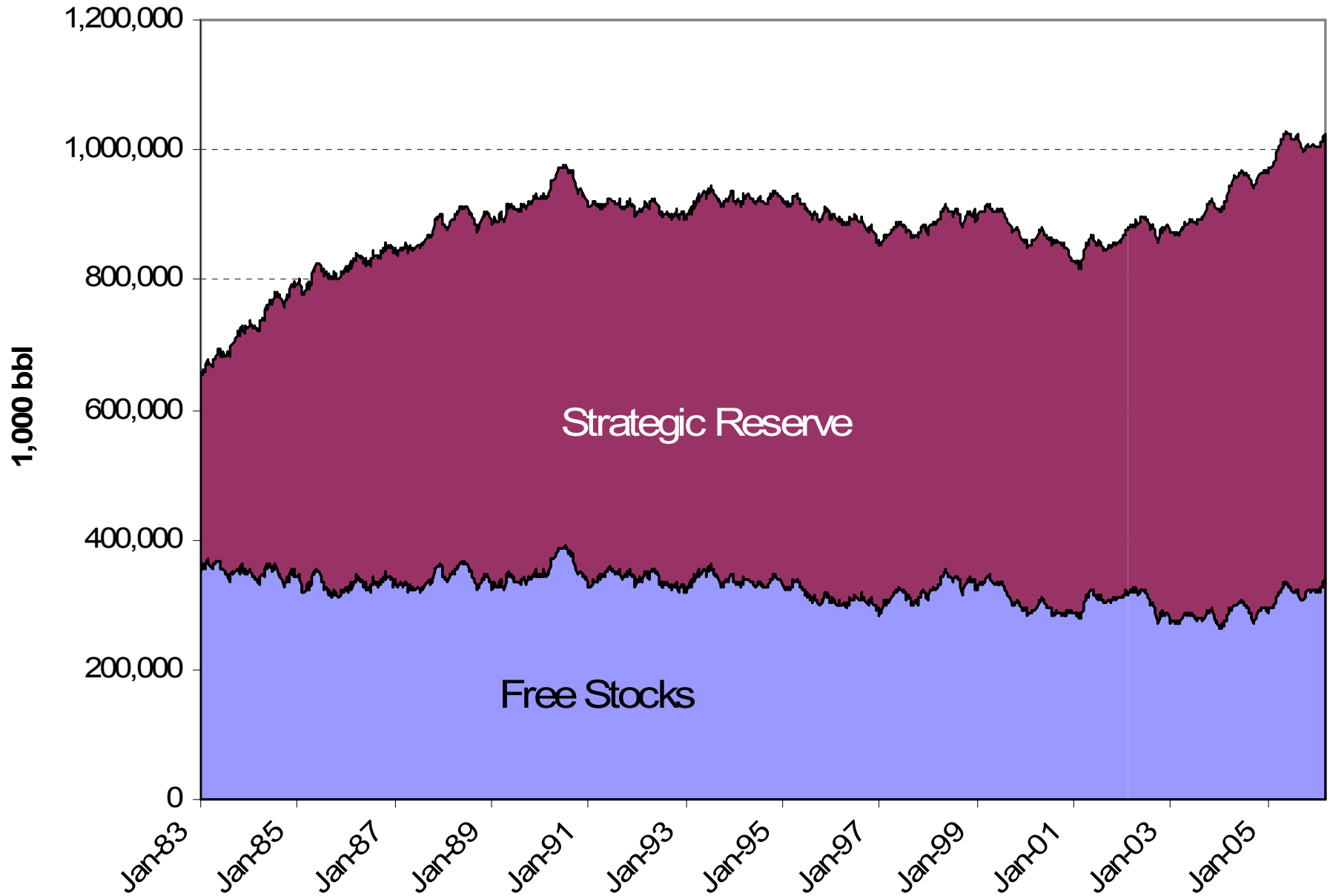
# U.S. Petroleum Supply, Consumption, and Net Imports, 1960-2030 (million barrels per day)



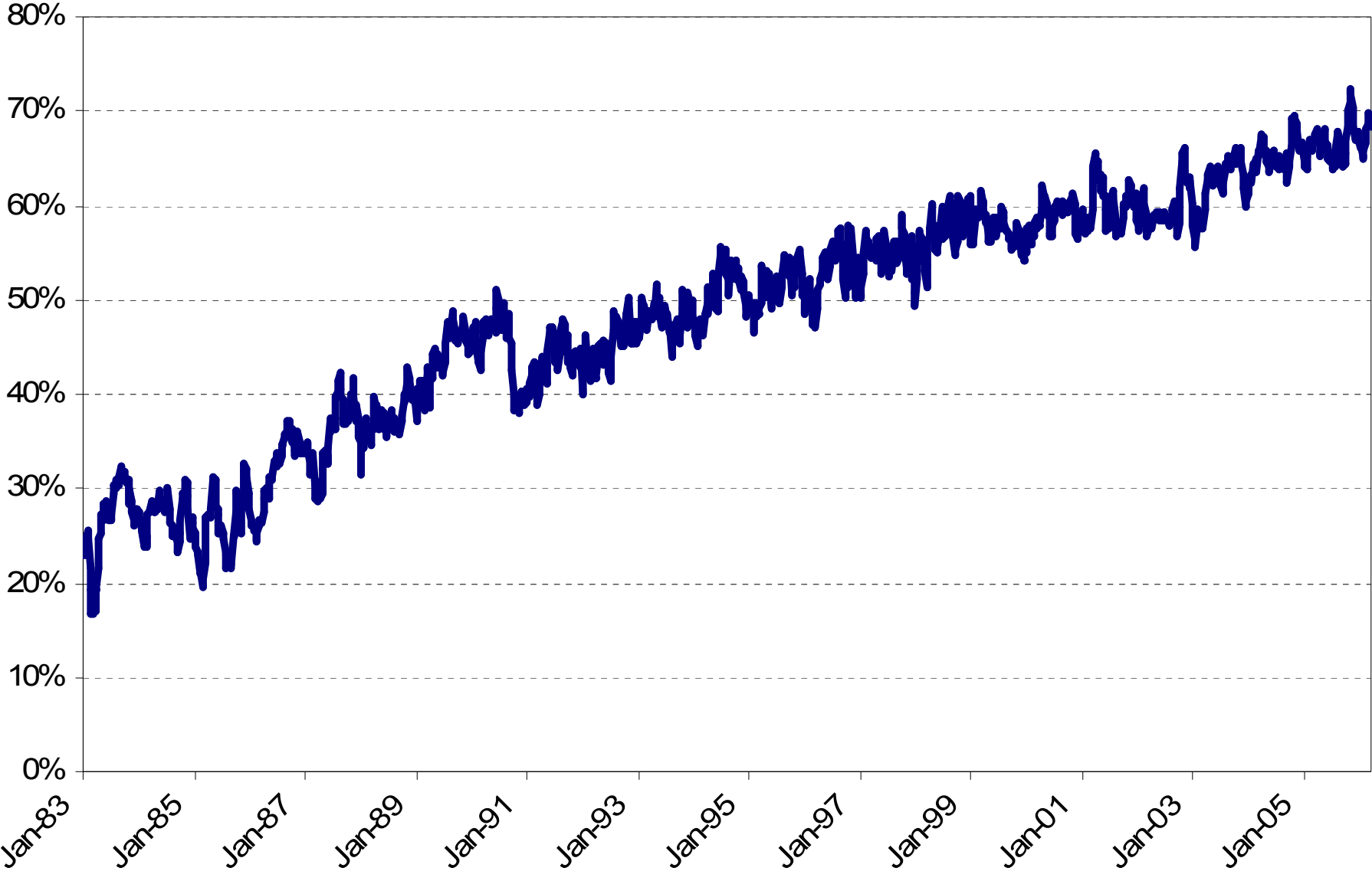
# Lower-48 Crude Oil Production by Source, 1970-2025 (million barrels per day)



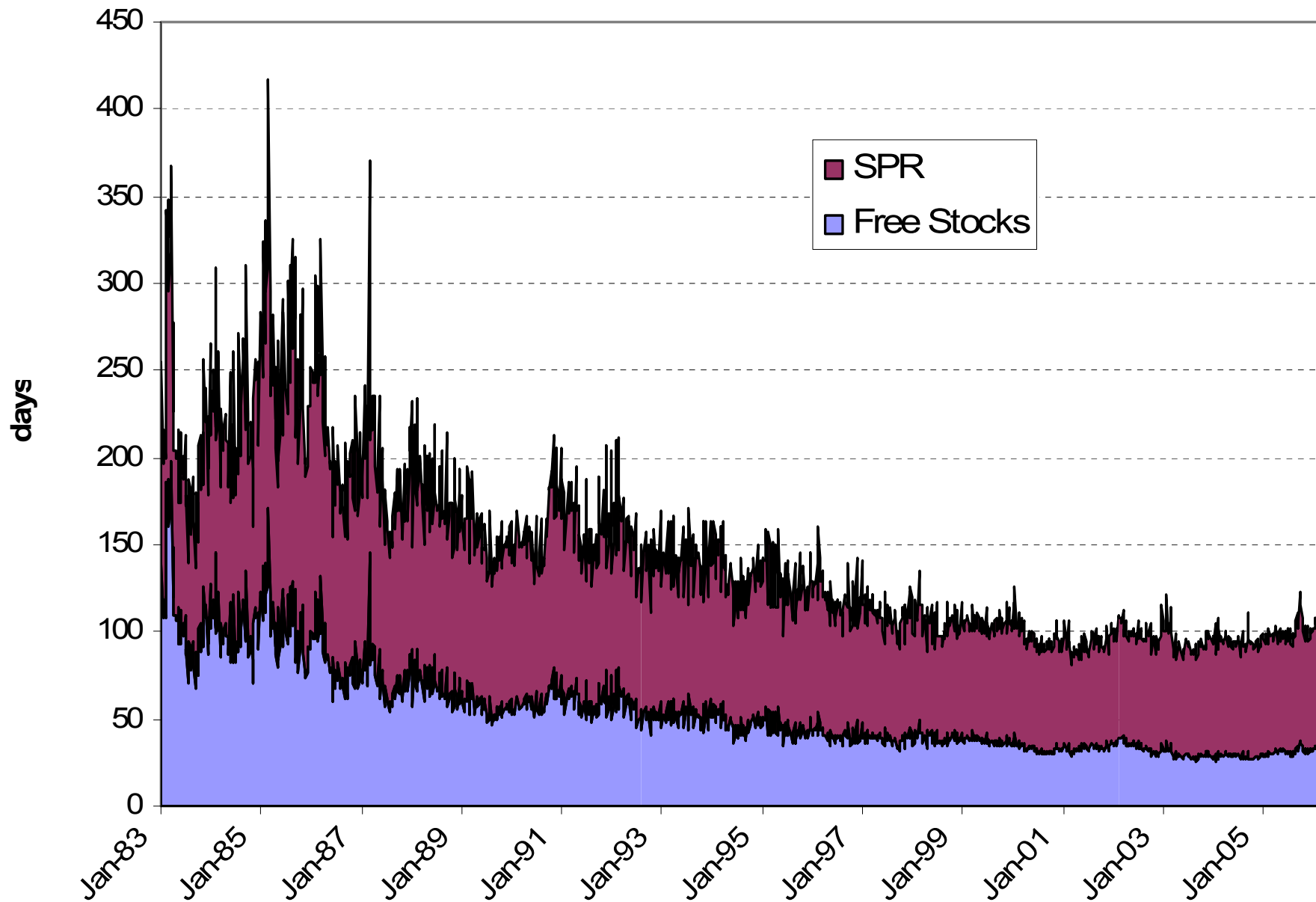
# U.S. Crude Stocks



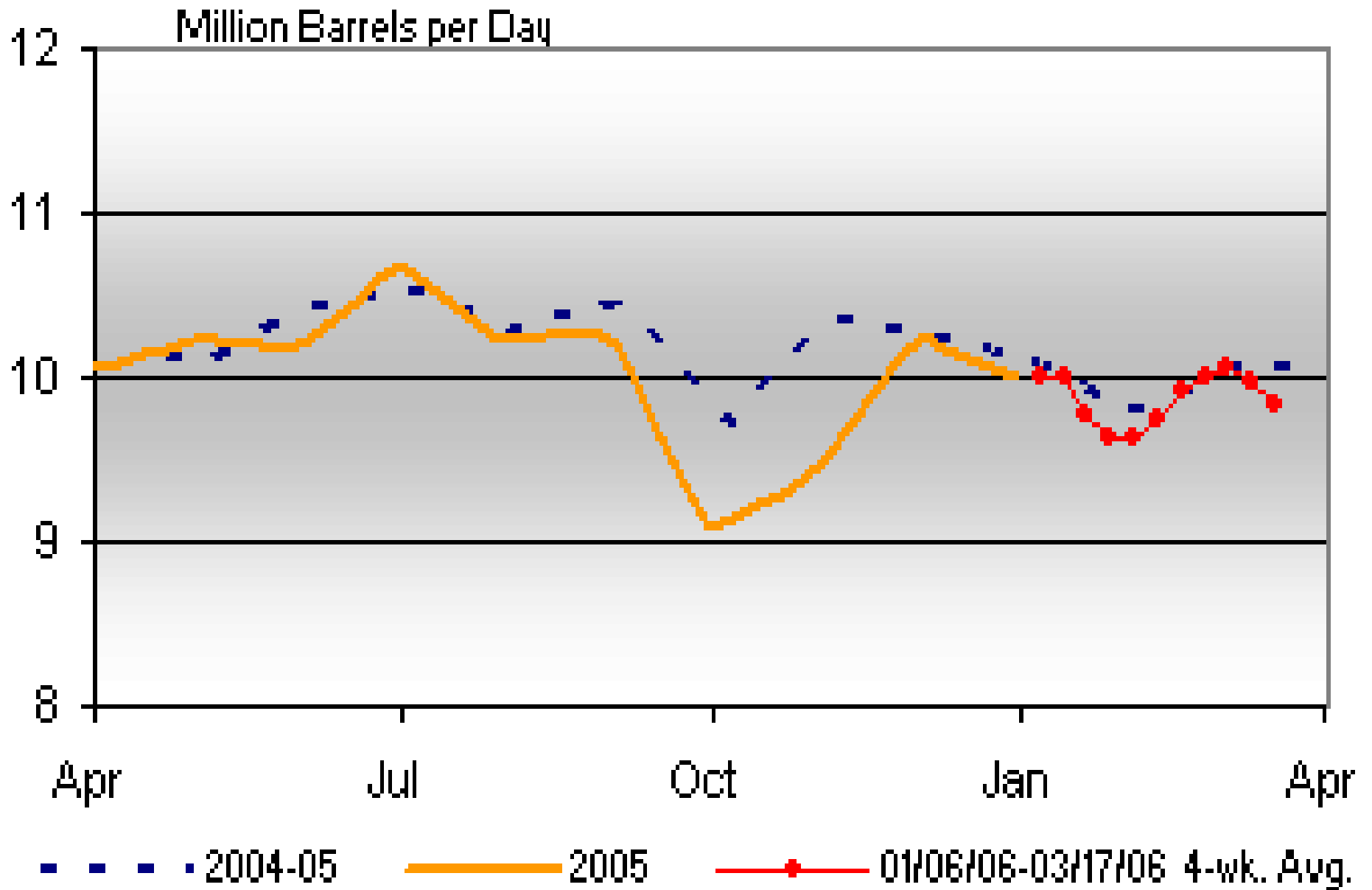
# Crude Imports vs. Runs



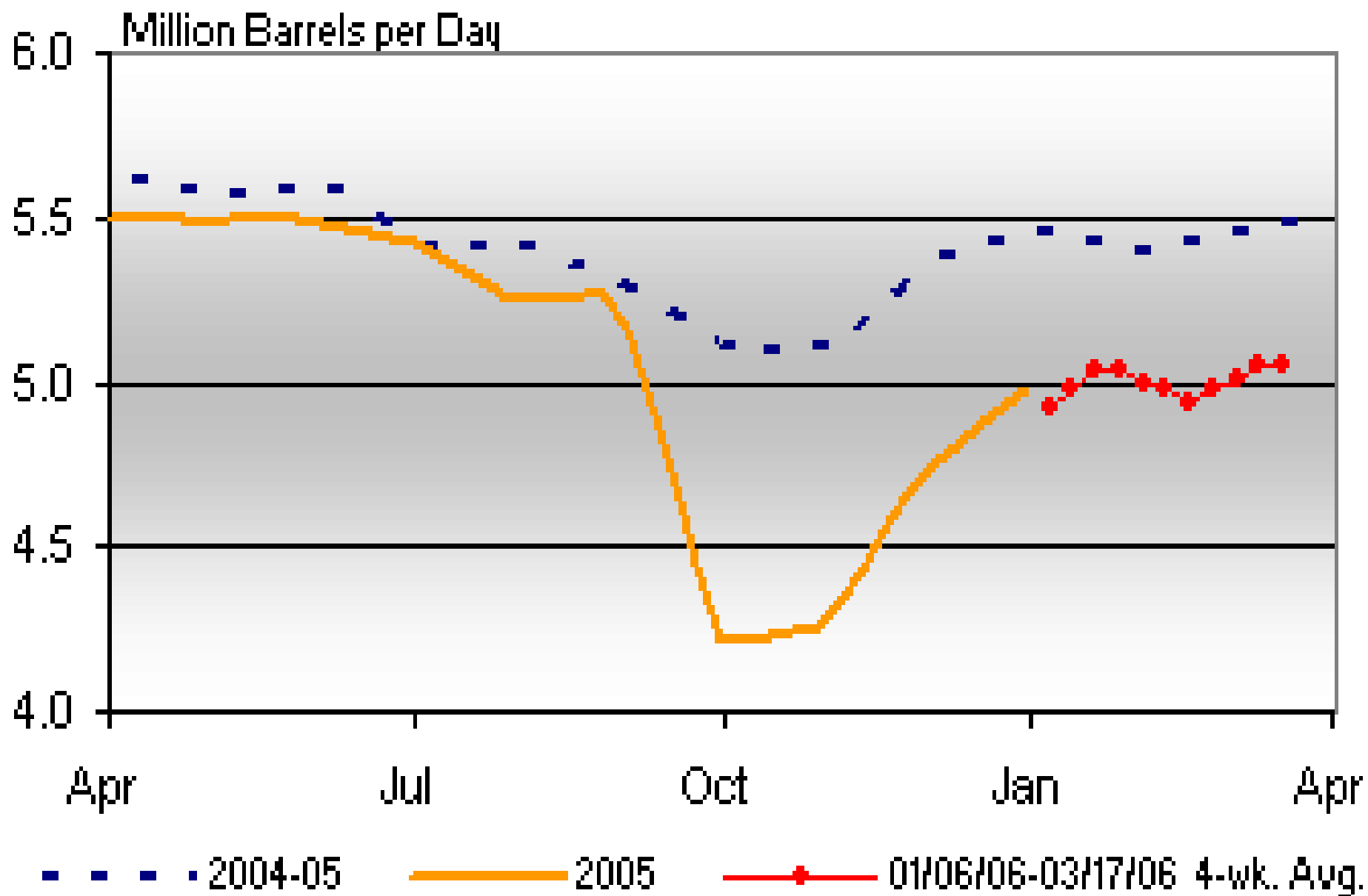
# US Crude Stocks - Days of Imports



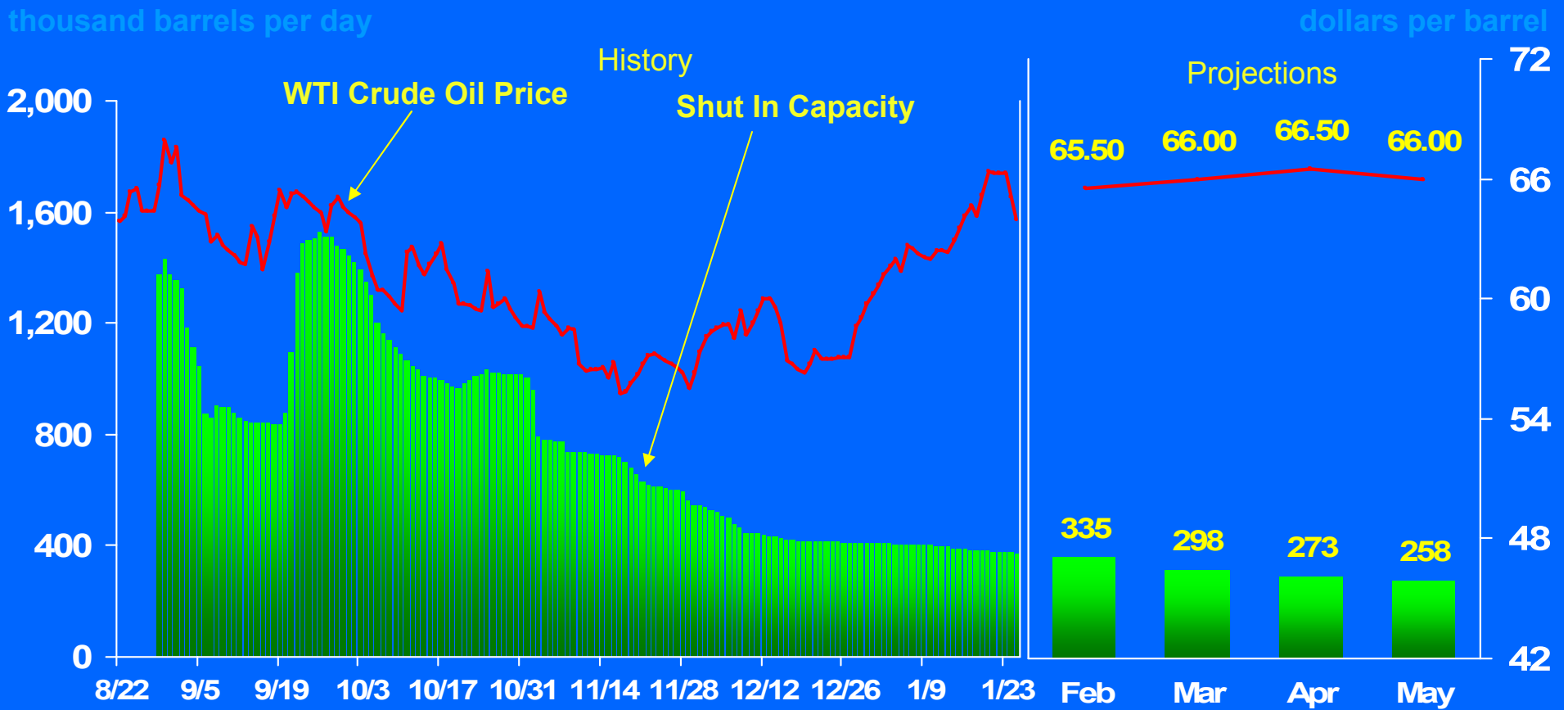
# U.S. Crude Oil Imports



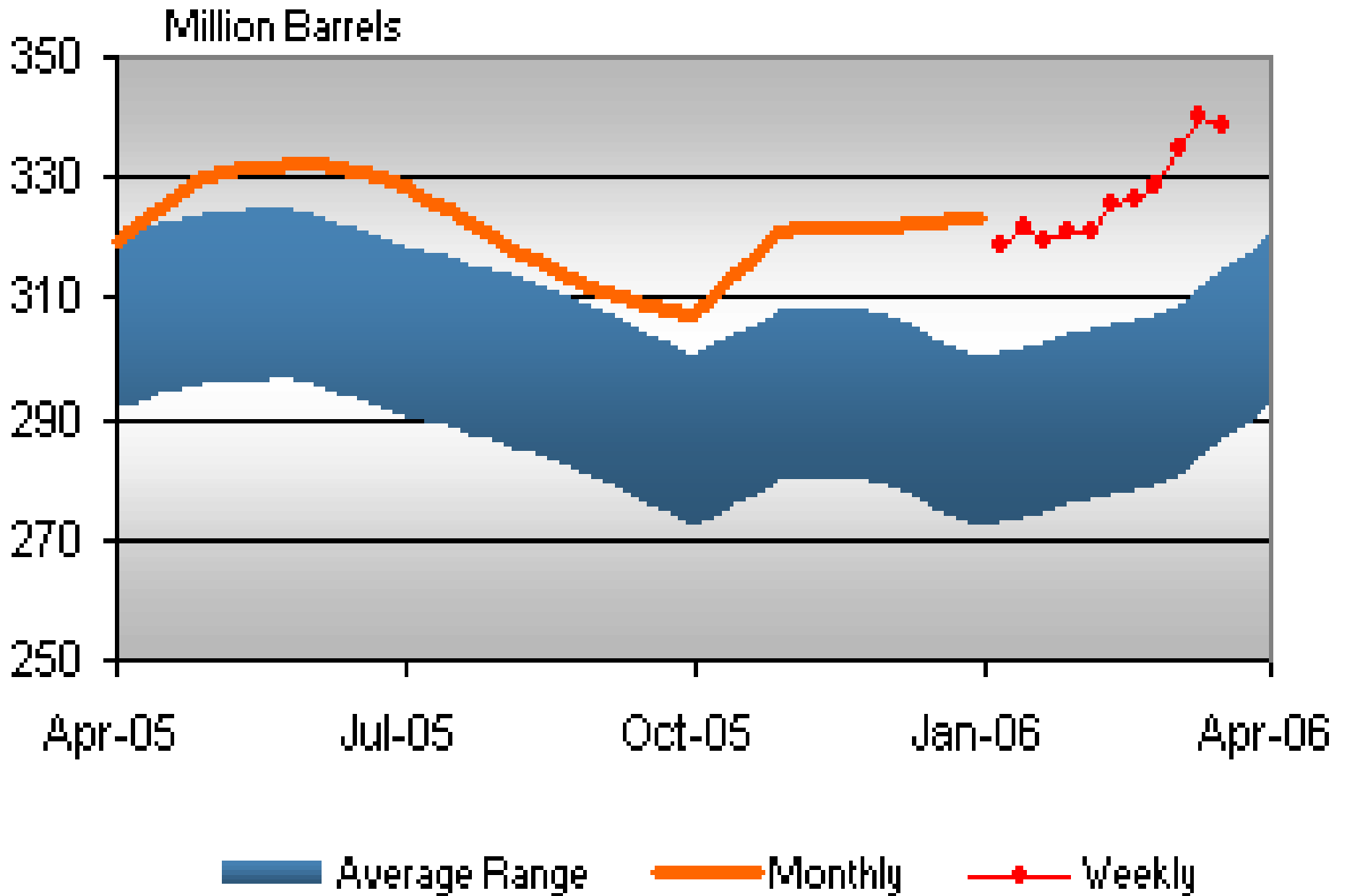
# U.S. Crude Oil Domestic Production



# Shut-In Federal Offshore Gulf Crude Oil Production



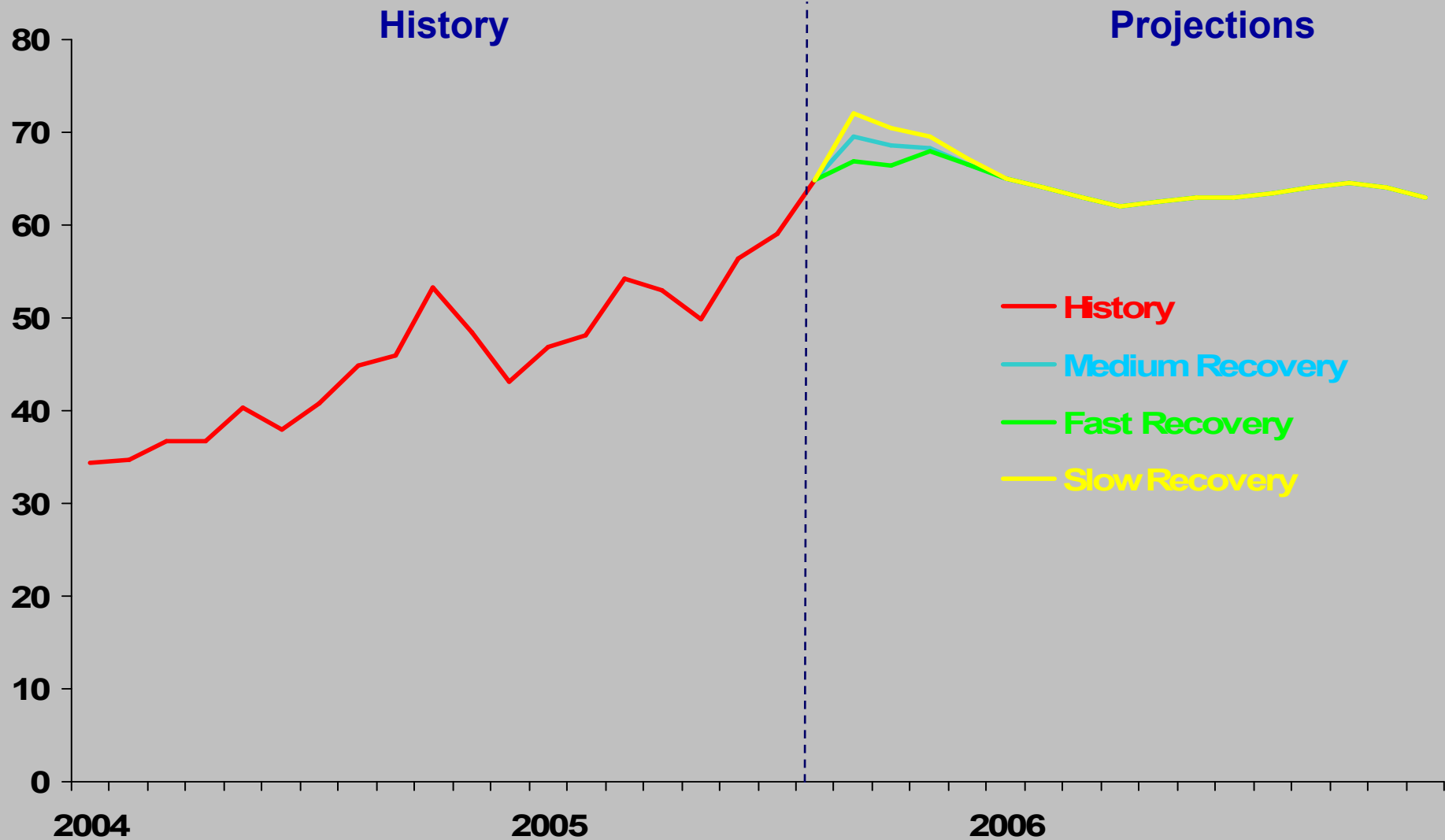
# U.S. Crude Oil Stocks



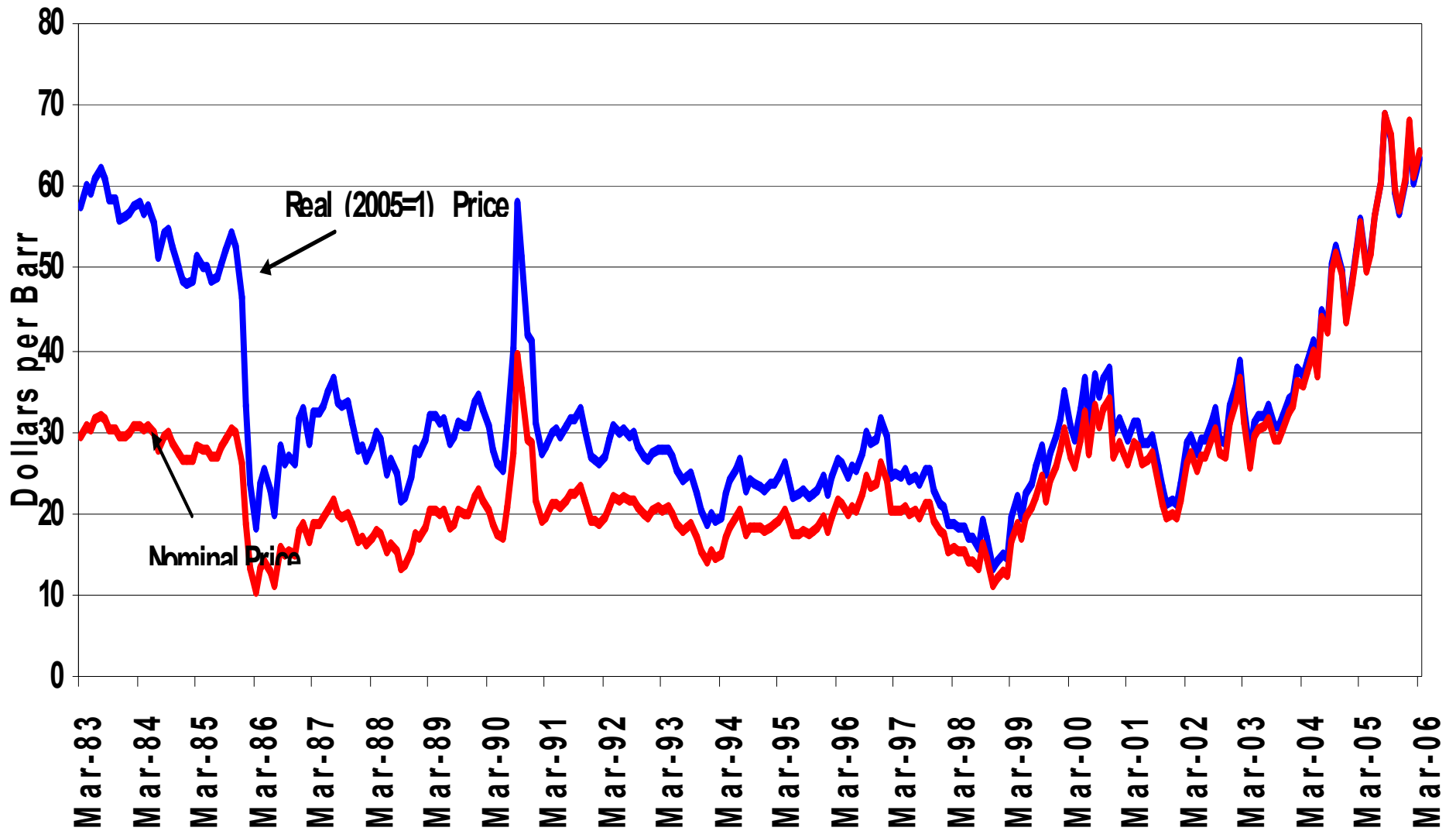
# Short-Term Crude Outlook

- inventories are at 5-year highs
- some domestic production still offline
- “new money” is buying commodities, especially energy
- OPEC is producing all out
- supply/demand balance is tight
- market is very nervous
- volatility will remain high

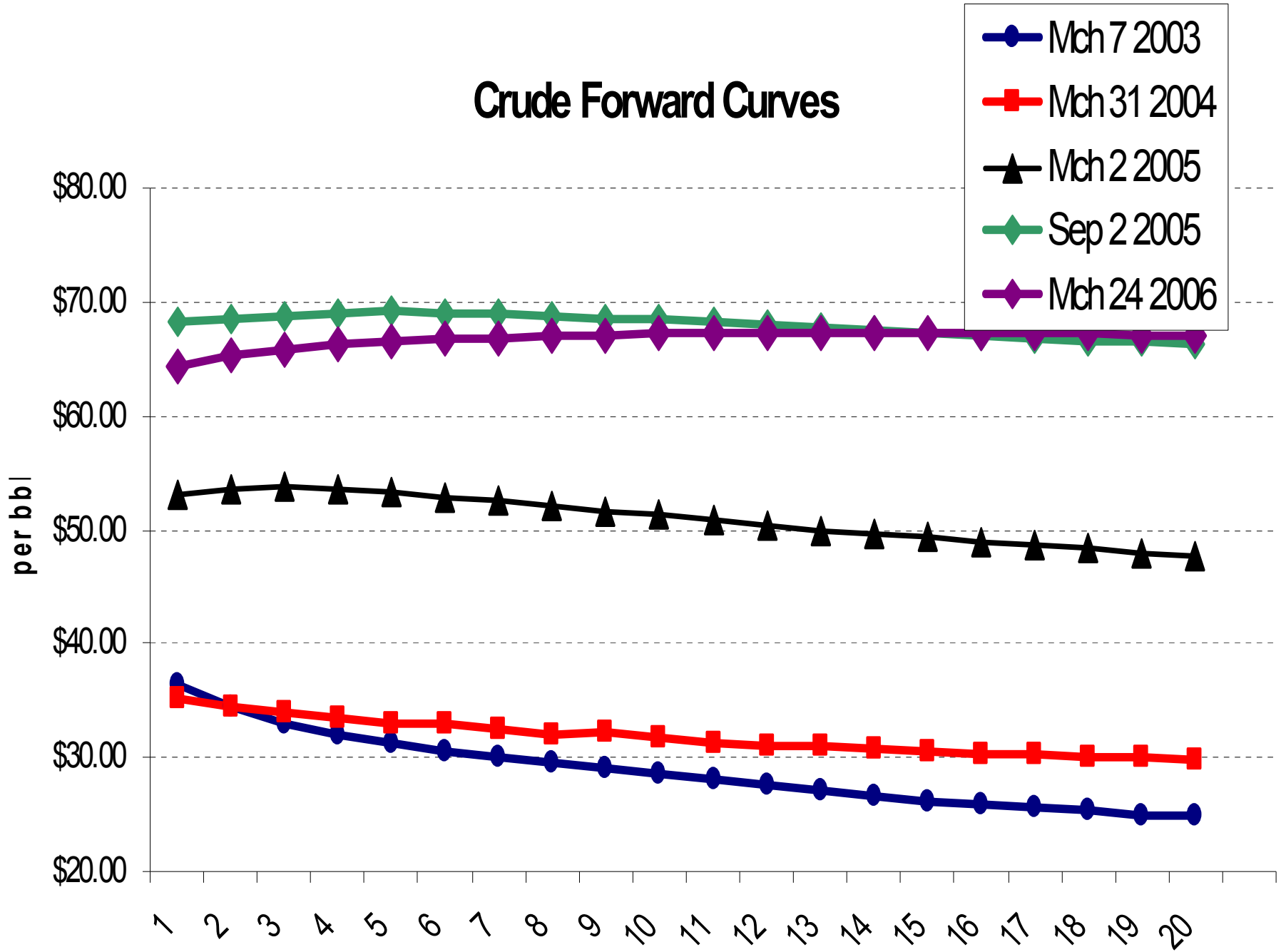
# West Texas Intermediate Crude Oil Price, 2004-2006 (dollars per barrel)



## Crude Oil Futures Prices: Nominal and Real



# Crude Forward Curves

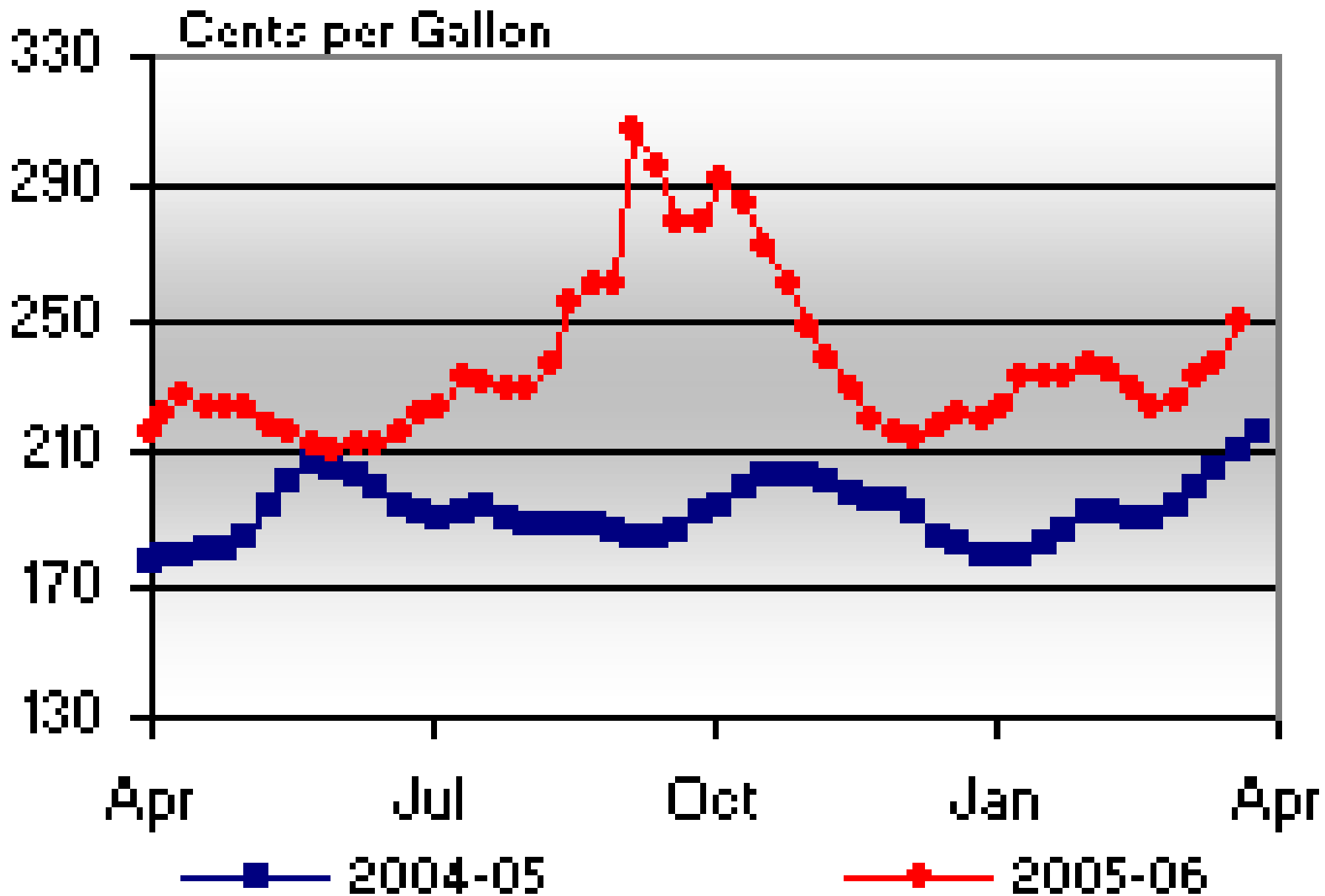


# Long Term Crude Oil Outlook

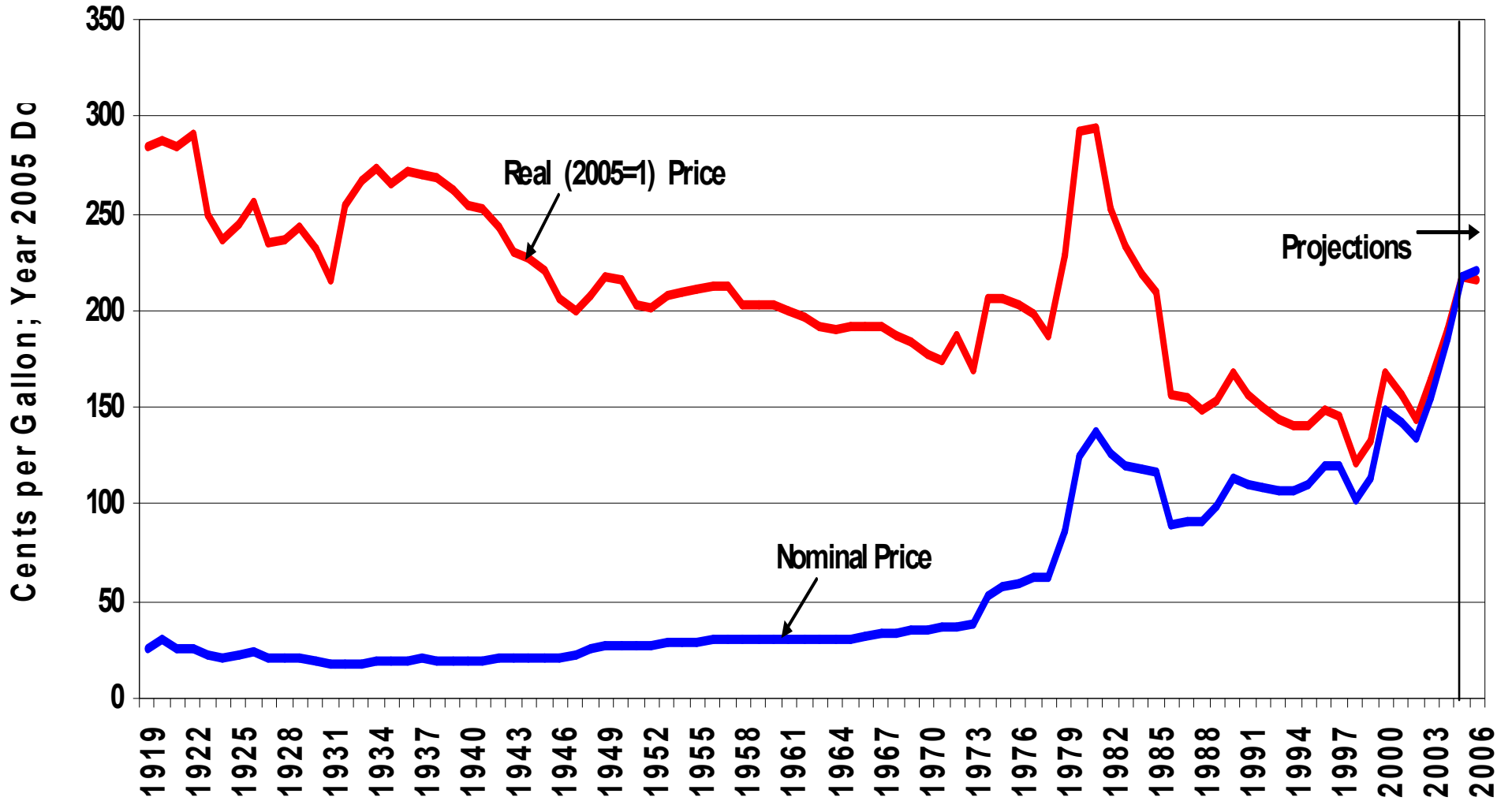
- Global crude production is peaking
- OPEC members have overstated their reserves and their ability to increase their output
- Consumption will have to fall by about 2% per year when the peak passes (to match production)
- The U.S. and other developed countries may become even more dependent in imports
- In real terms, crude prices will ration supplies and reduce consumption
- High forward crude prices provide “shelter” for investing in alternative energy sources.

# The Products

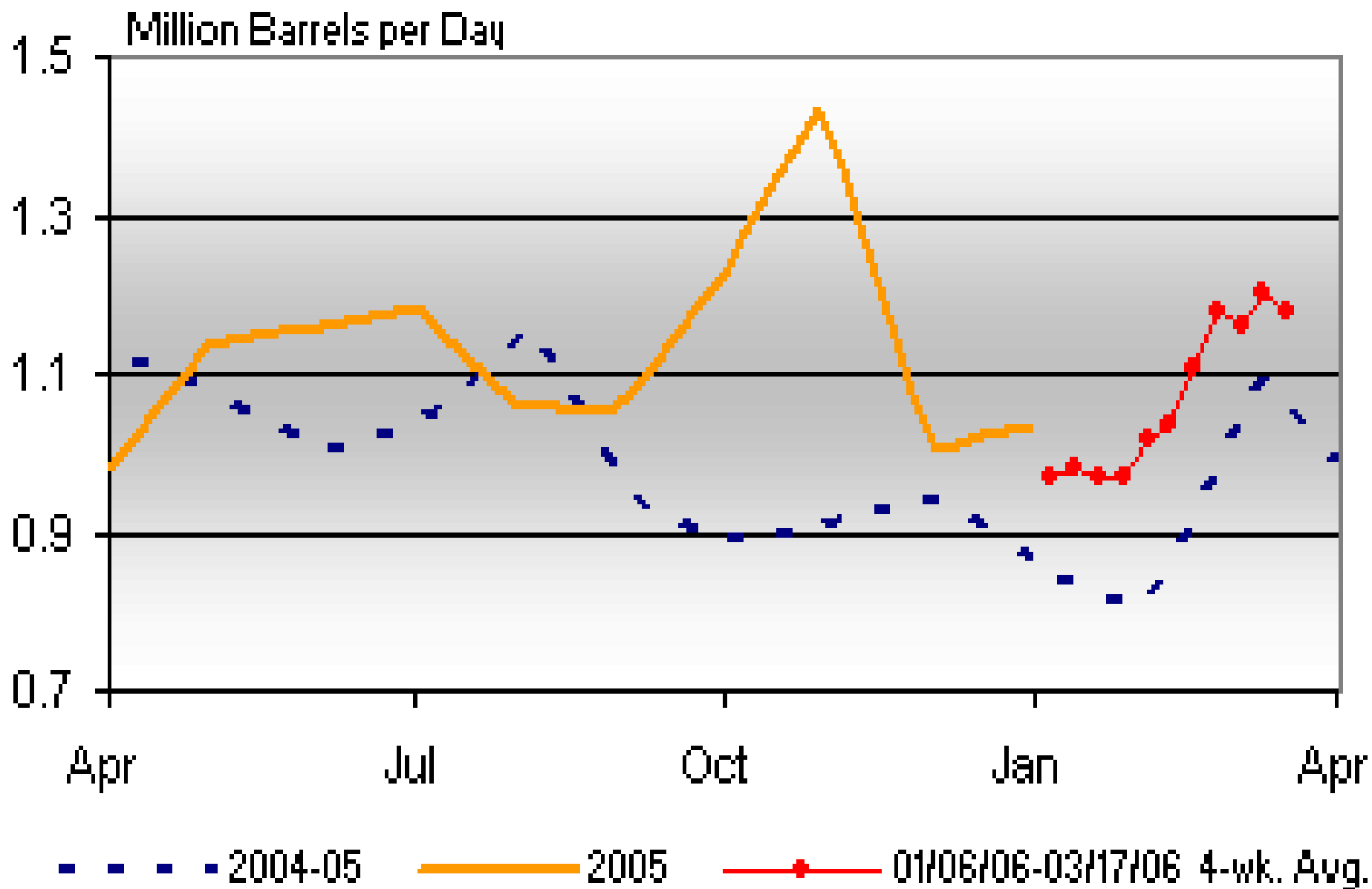
# Regular Gasoline Prices



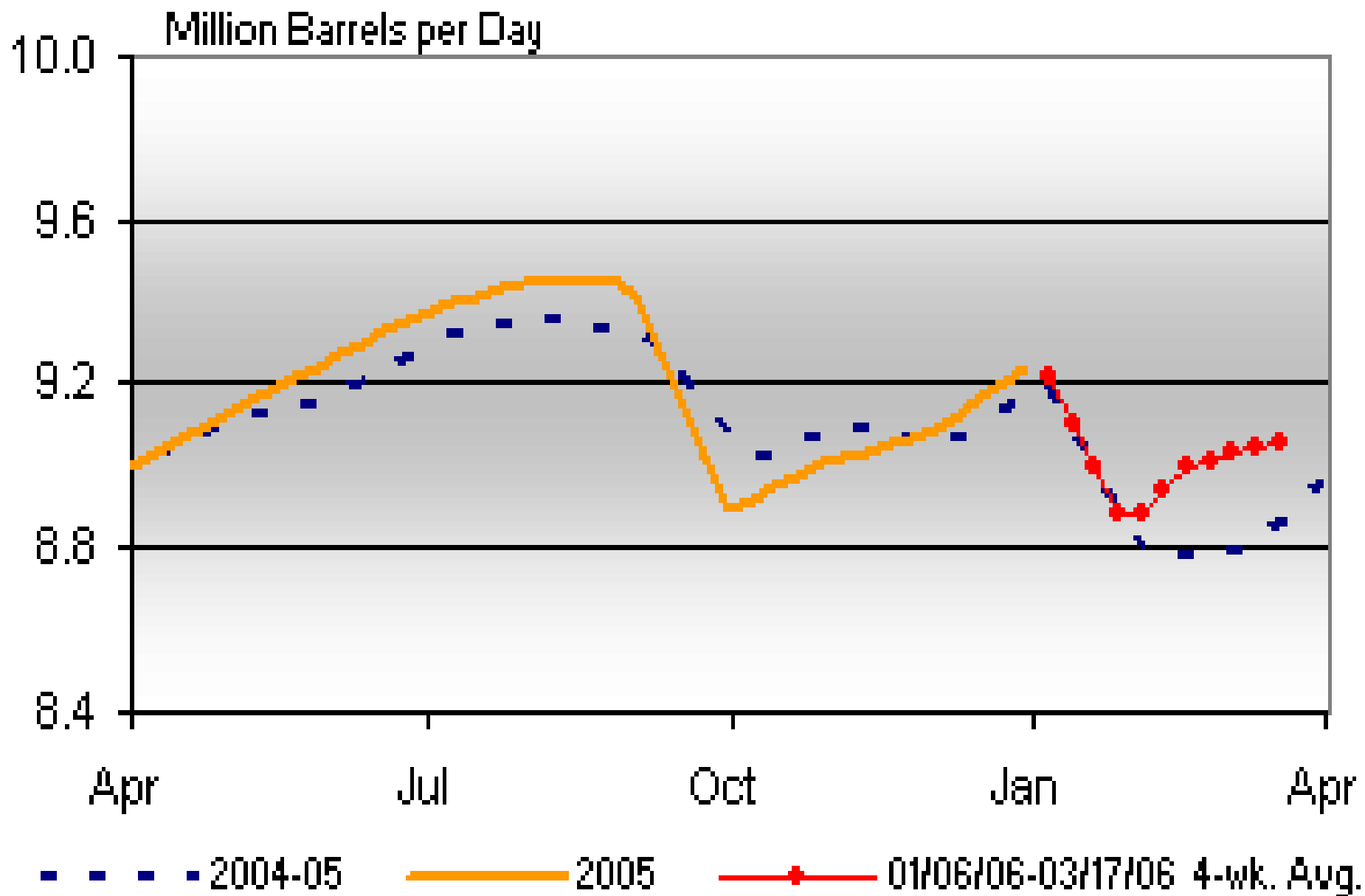
Real Gasoline Pump Price: Annual Average 1919-2006



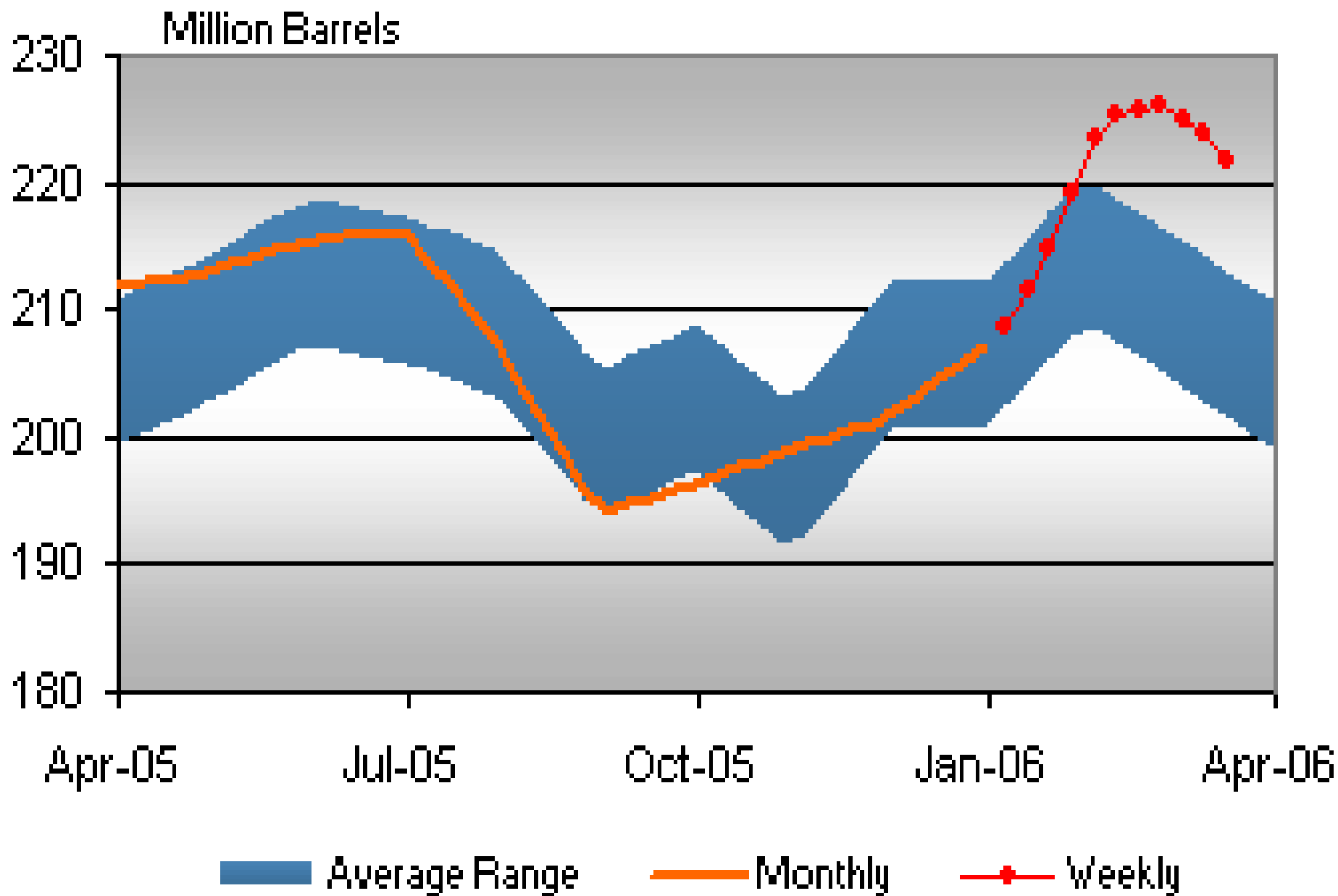
# U.S. Total Gasoline Imports



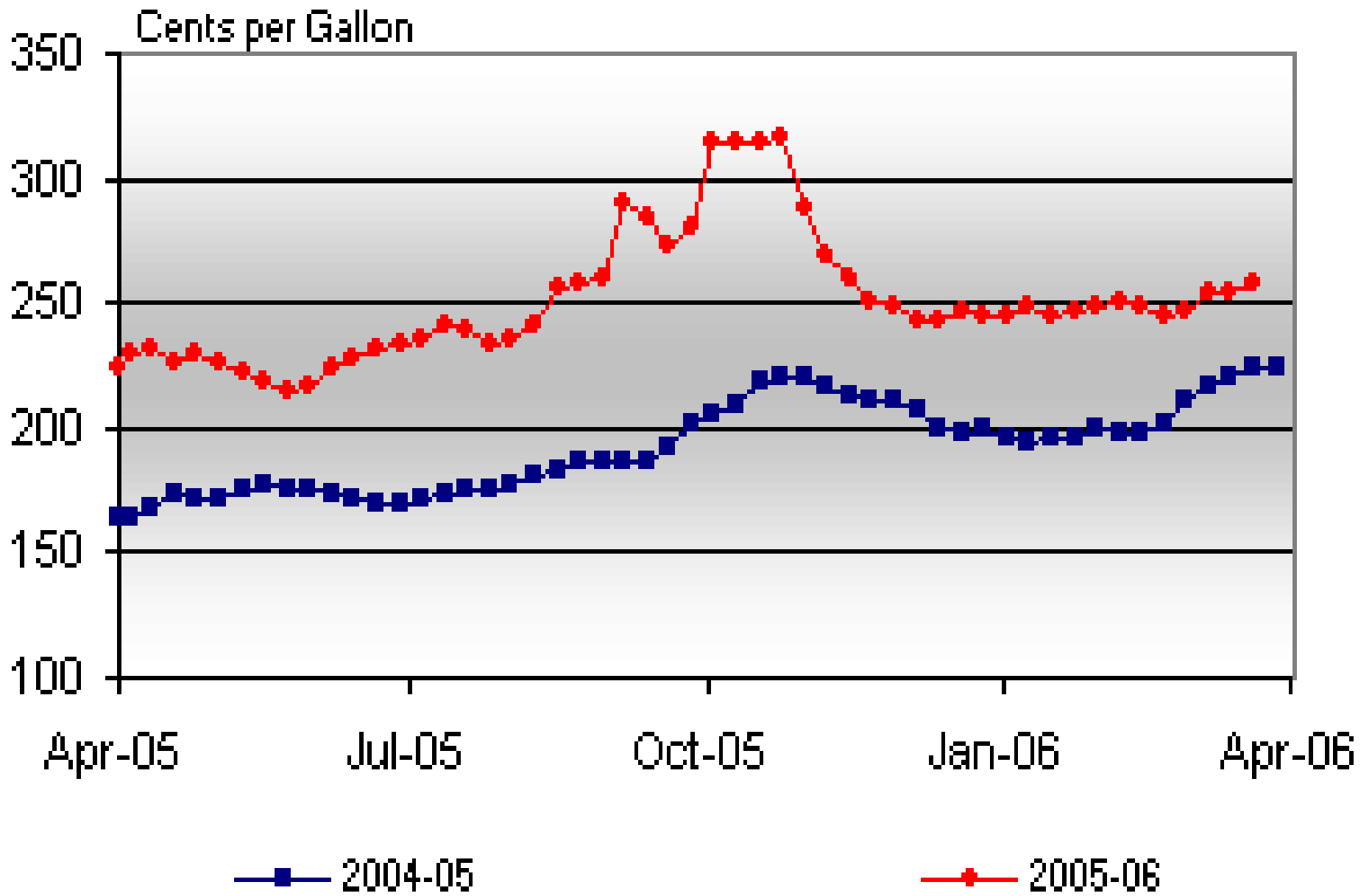
# U.S. Gasoline Demand



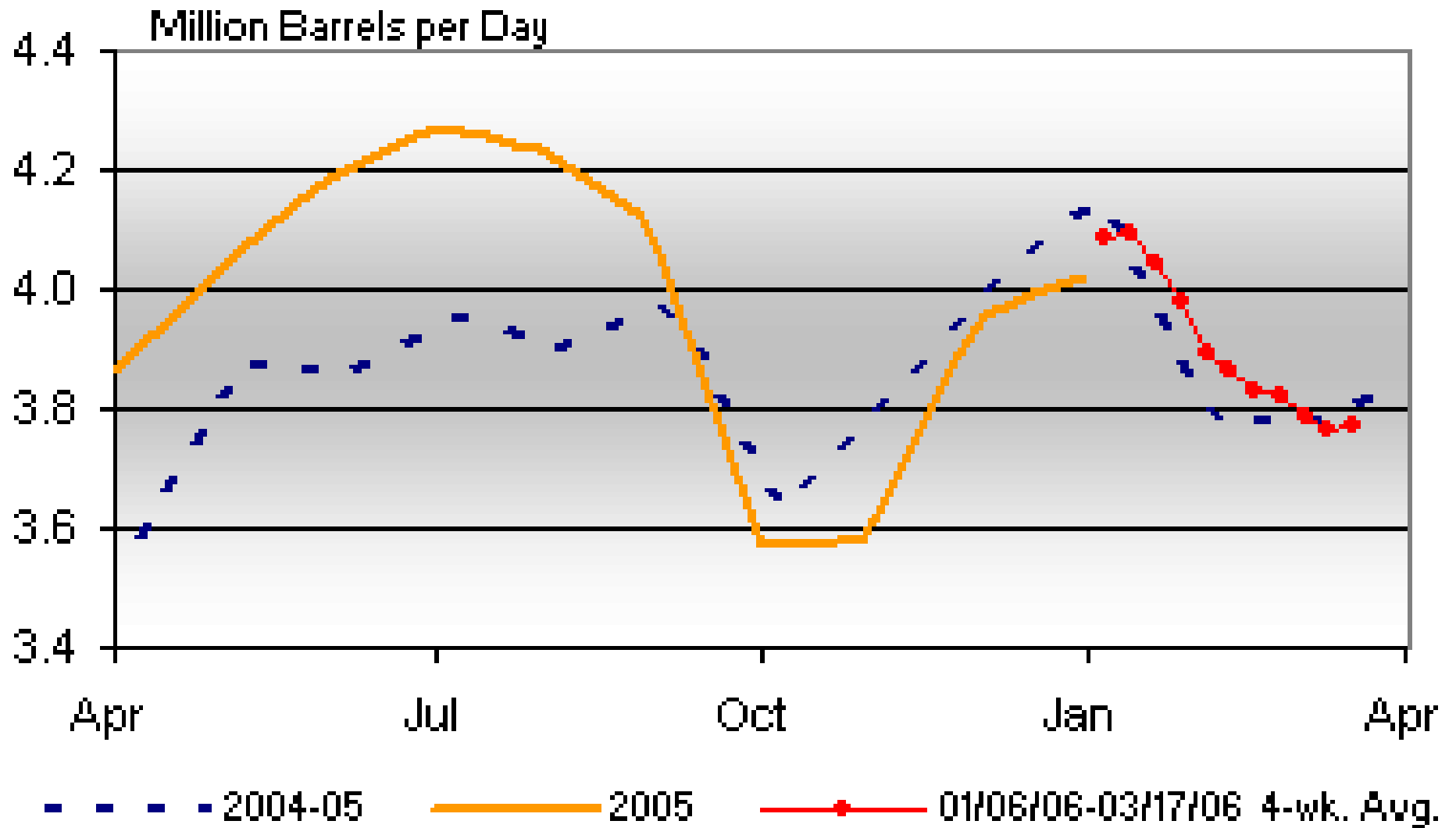
# U.S. Gasoline Stocks



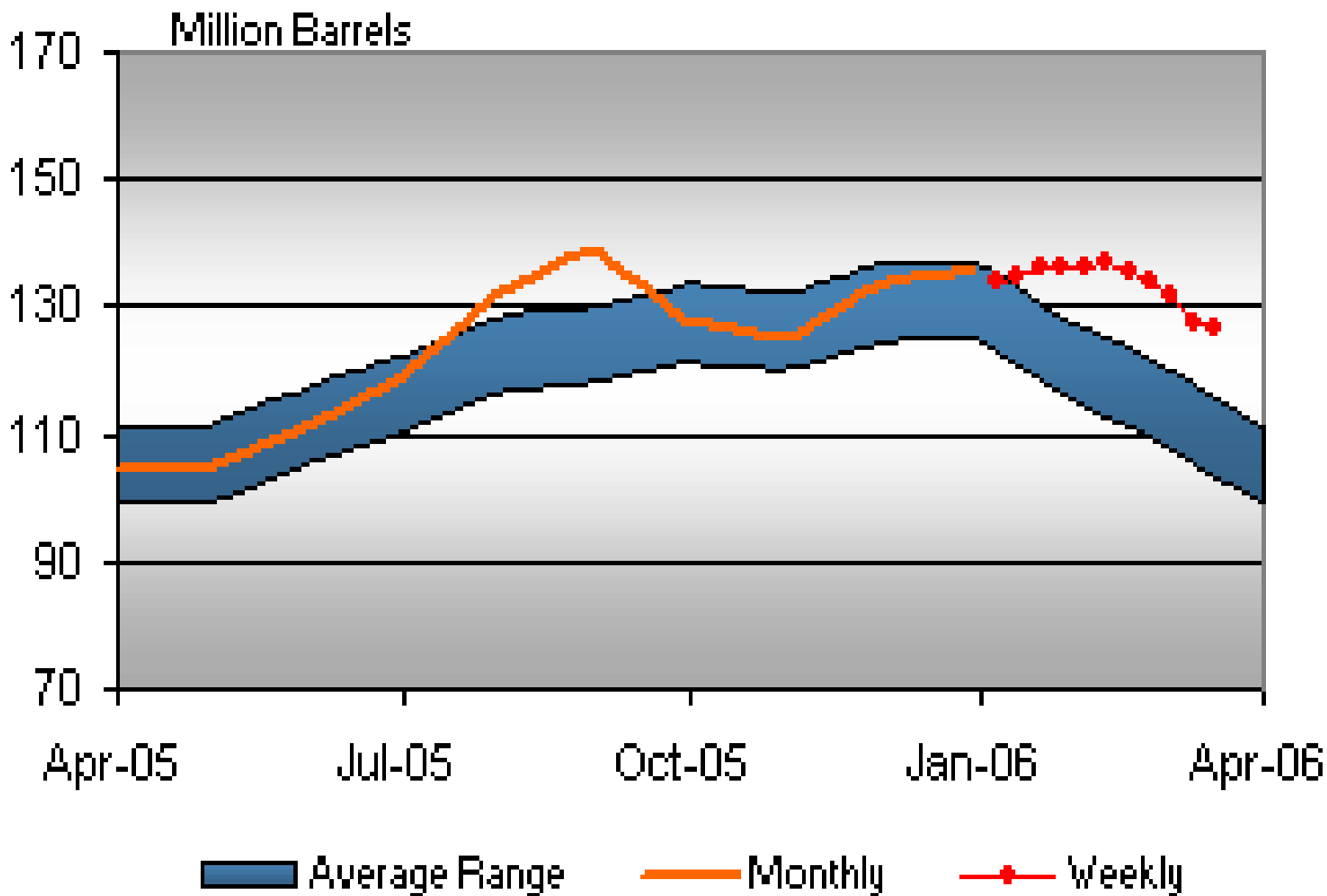
# On-Highway Diesel Fuel Prices



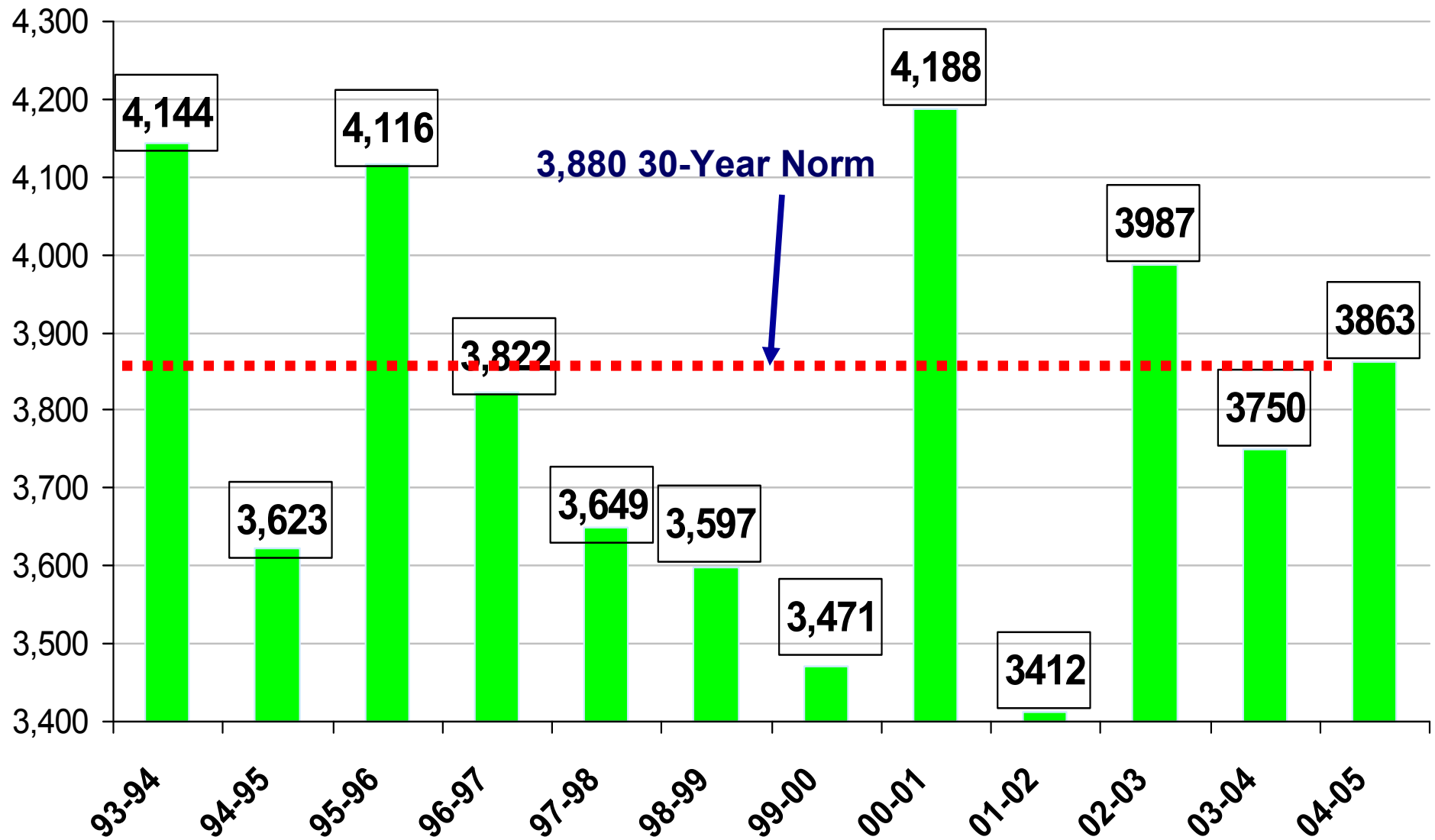
# U.S. Distillate Production



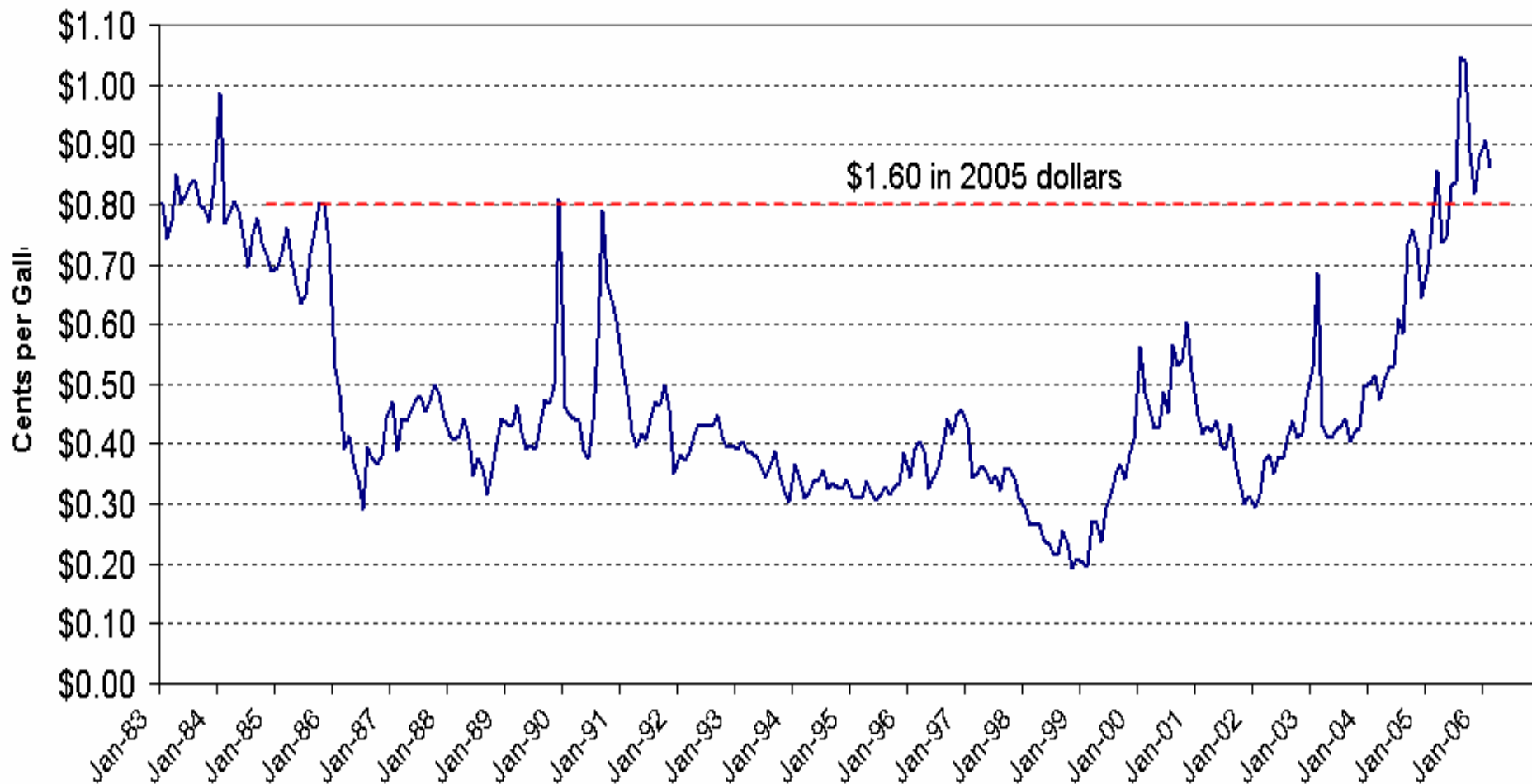
# U.S. Distillate Stocks



# U.S. Heating Degree Days Oct – March (1993-2005)



## NYMEX Heating Oil in Constant 1984 Dollars (Adjusted by Bureau of Labor Statistics Consumer Price Index)



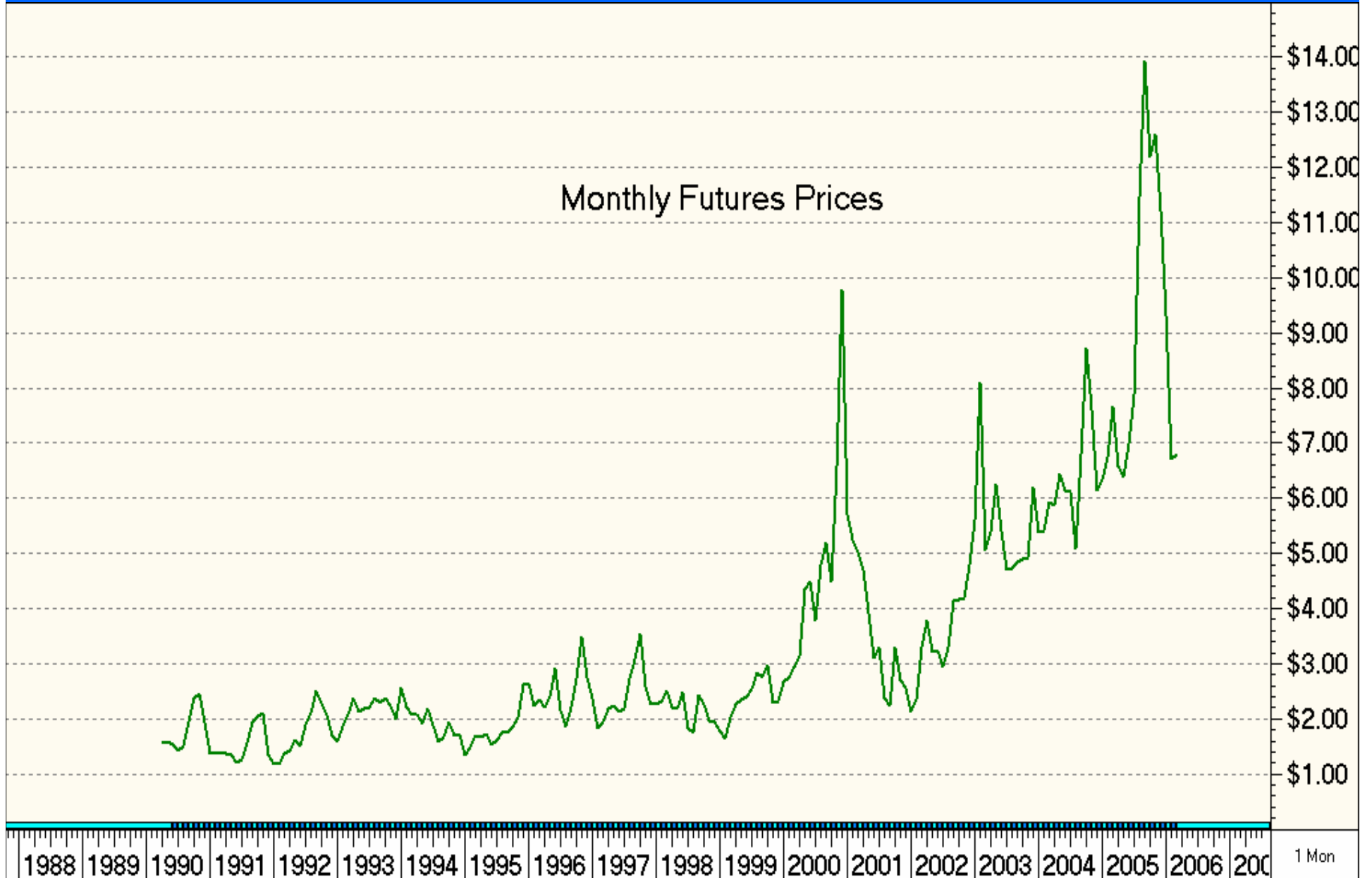
# Products Outlook

- Distillate stocks are record high, due to mild winter and generous crack margins
- Gasoline stocks are also record high, but spot shortages can arise and ethanol vs. MTBE is increasing costs
- Refinery capacity was a constraint even before Katrina & Rita, so refining margins should stay strong. However, "windfall profits" could be prevented or taxed away.
- Cracks of \$15-20/bbl may become typical

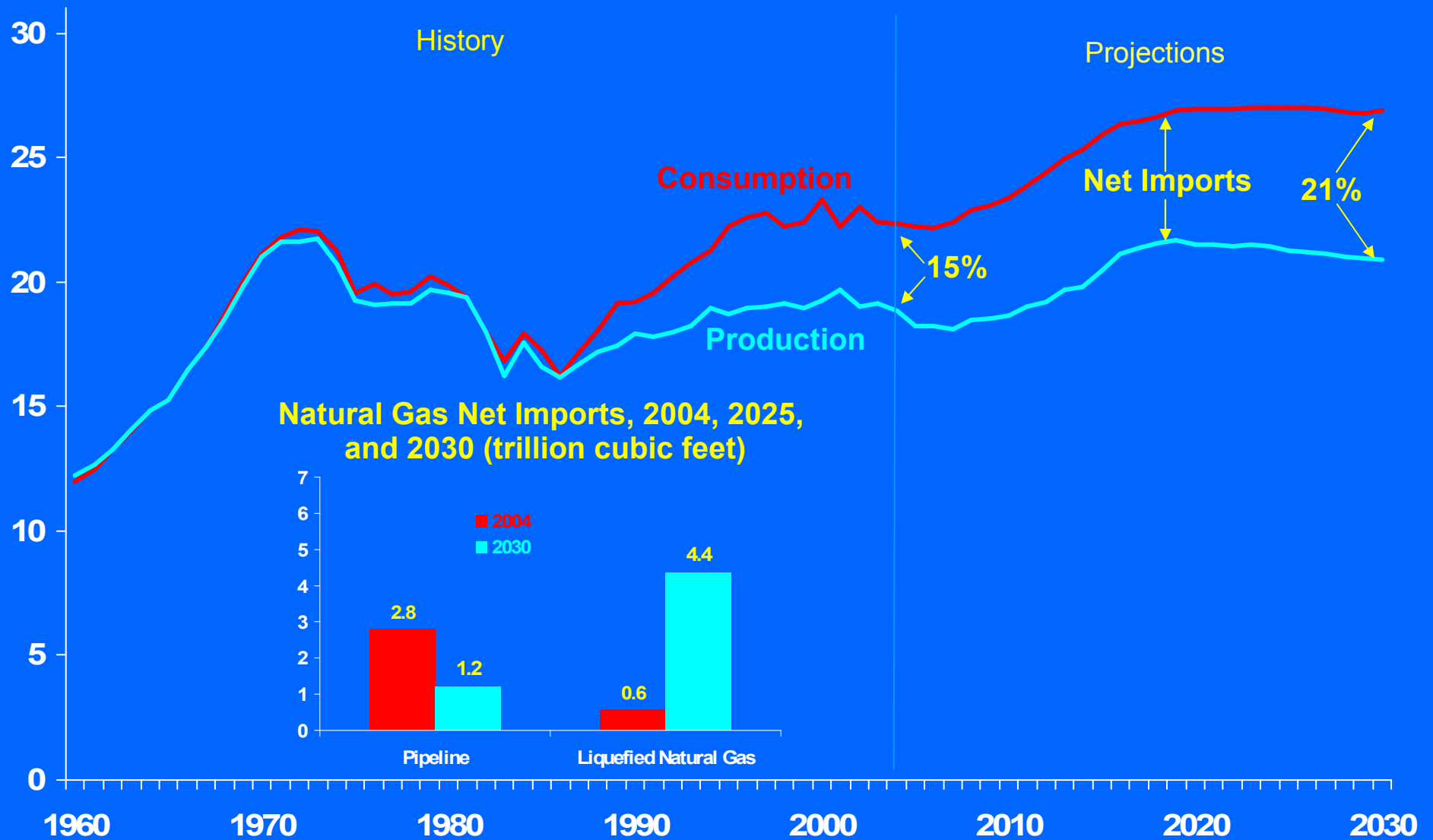
# Natural Gas

# Natural Gas Futures Prices

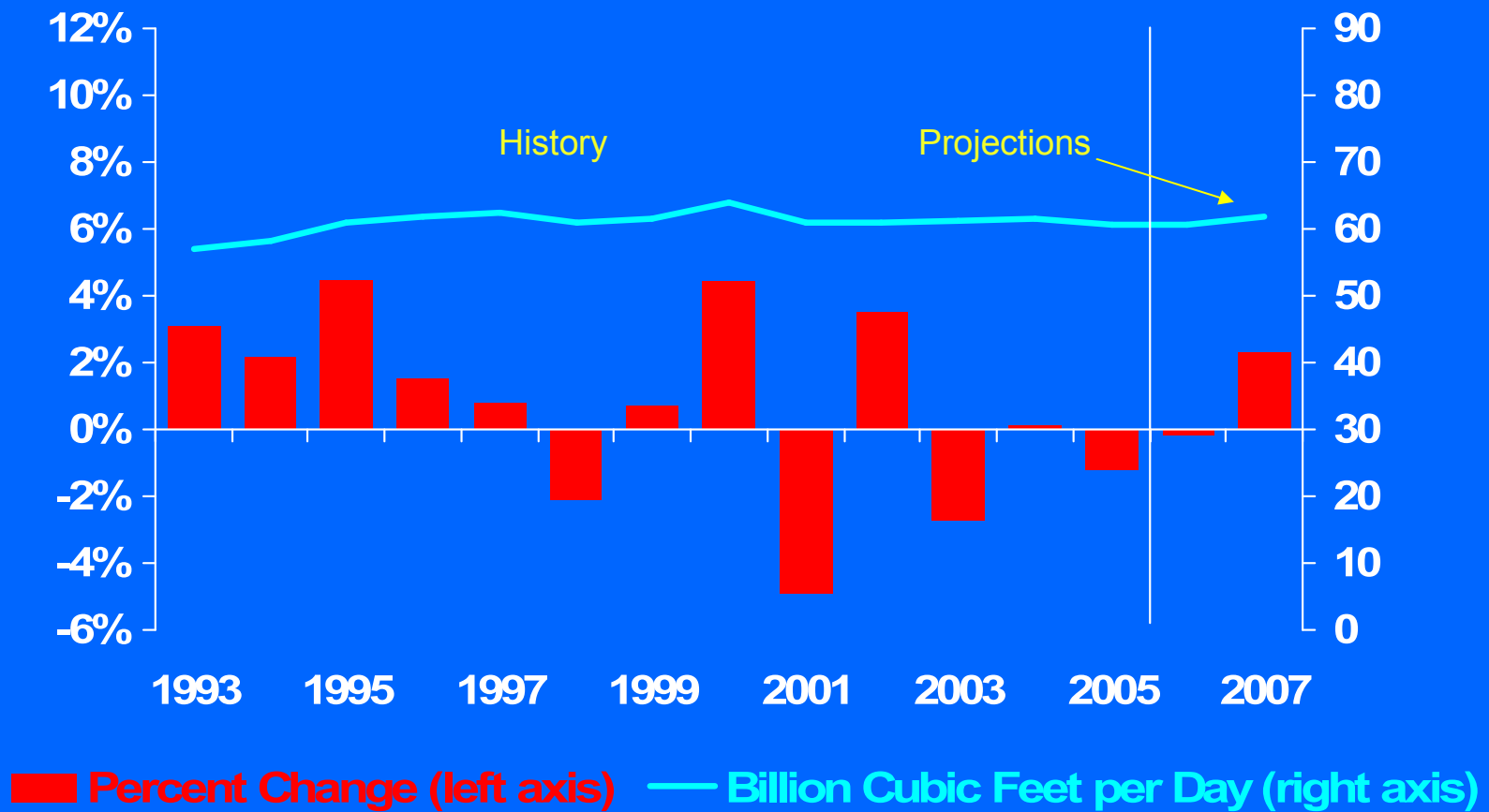
Monthly Futures Prices



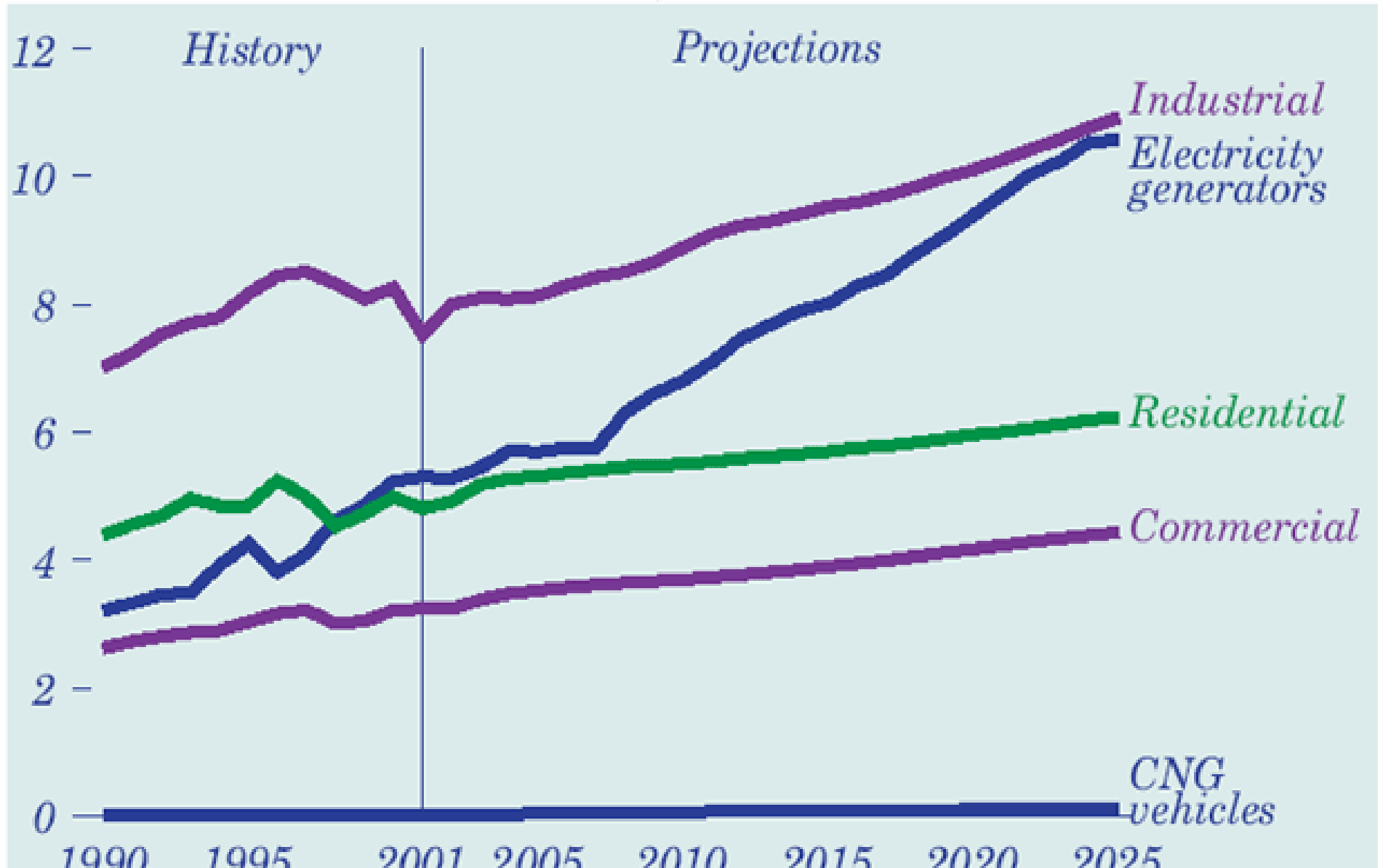
# U.S. Natural Gas Production, Consumption, and Net Imports, 1960-2030 (trillion cubic feet)



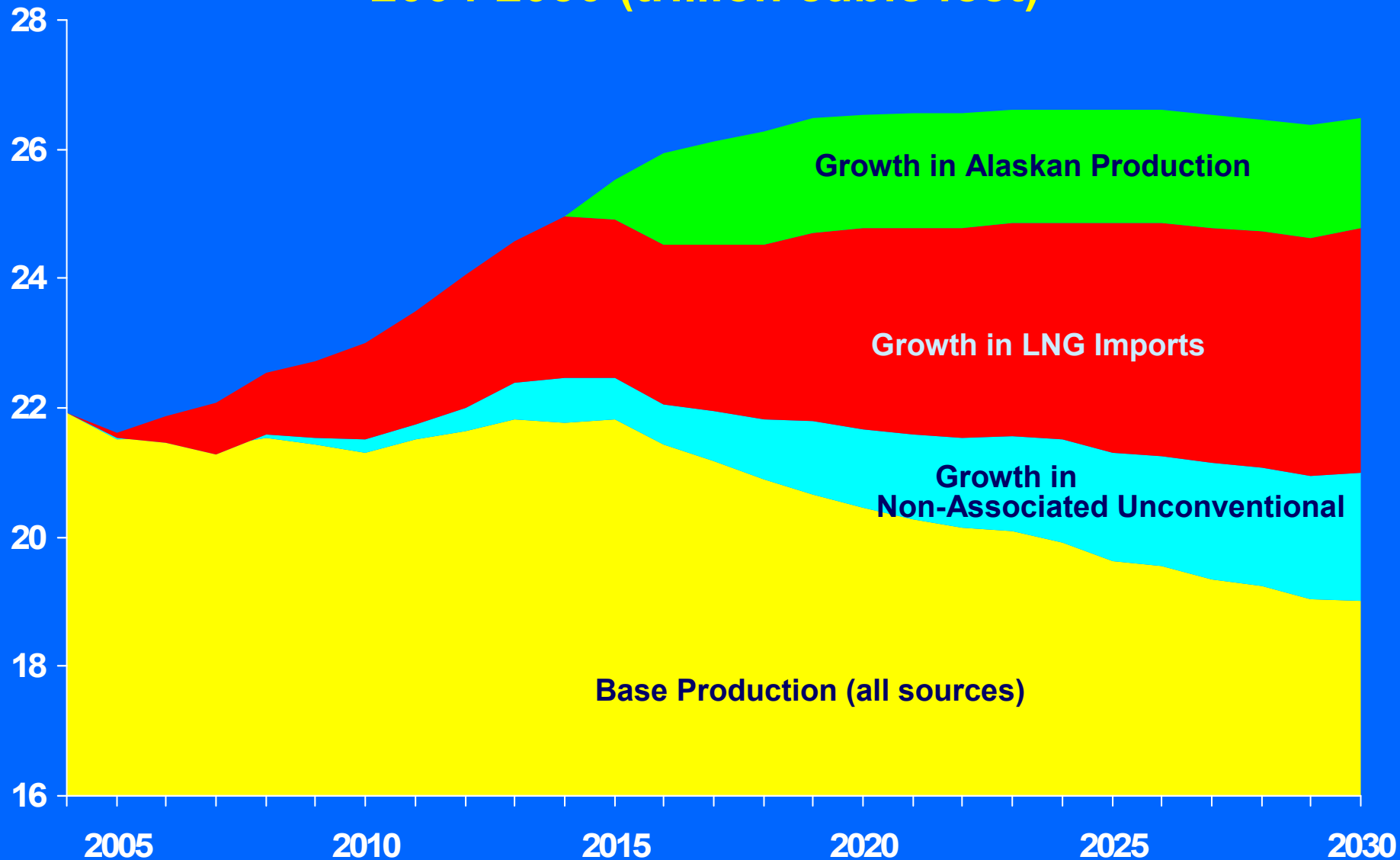
# U.S. Natural Gas Demand Growth



**Figure 82. Natural gas consumption by sector, 1990-2025 (trillion cubic feet)**

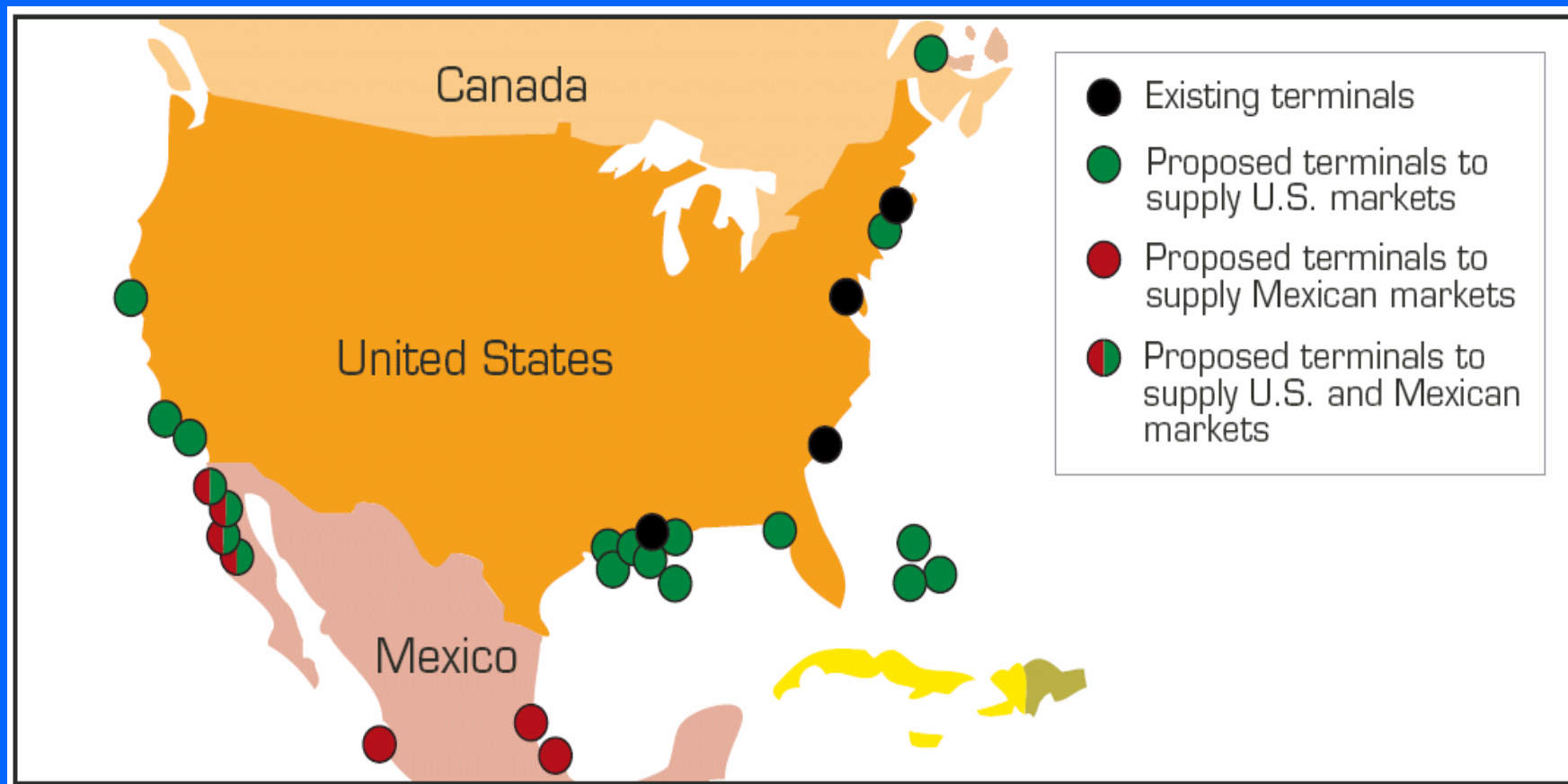


# Major Sources of Incremental U.S. Natural Gas Supply, 2004-2030 (trillion cubic feet)



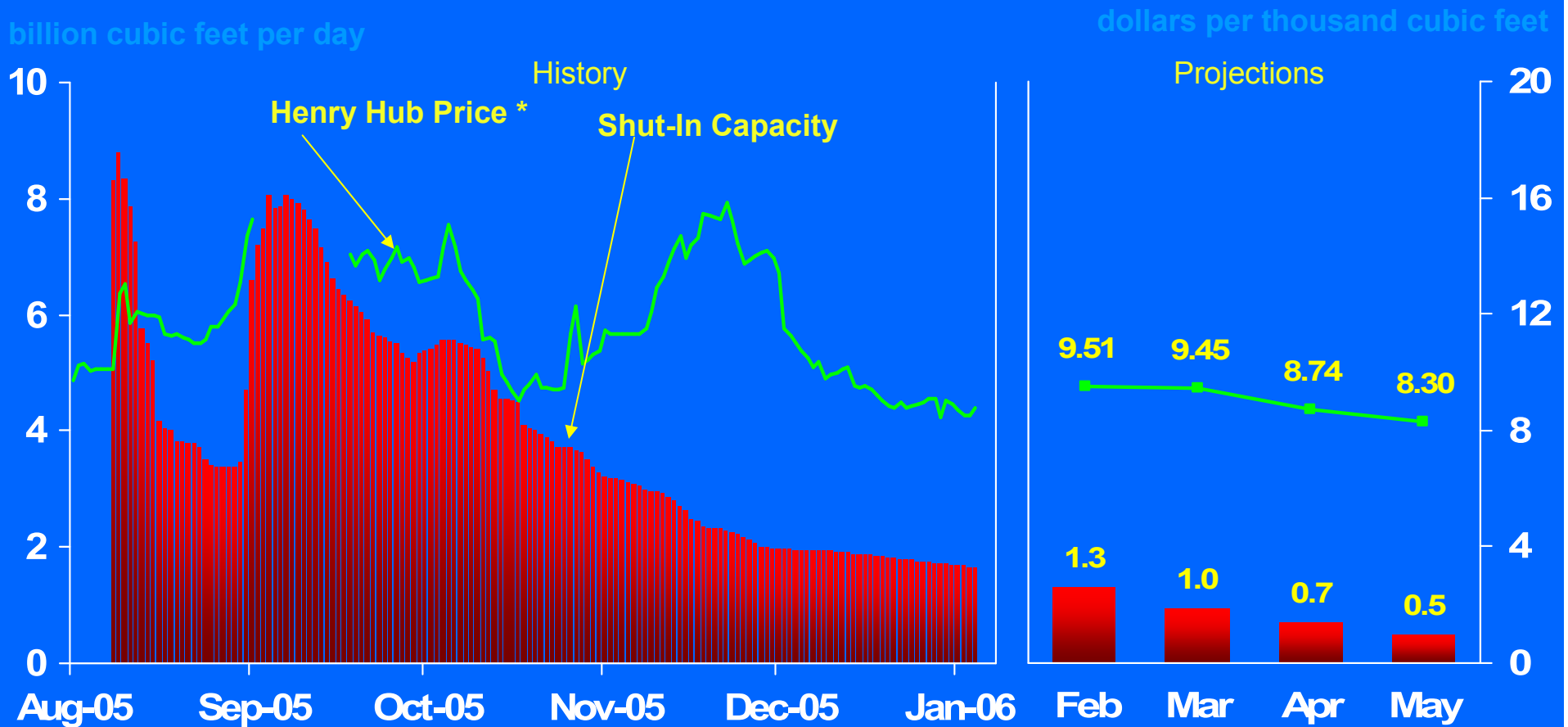
# LNG Growth Will Not Happen Immediately

## *Potential Locations for LNG Regasification Terminals*



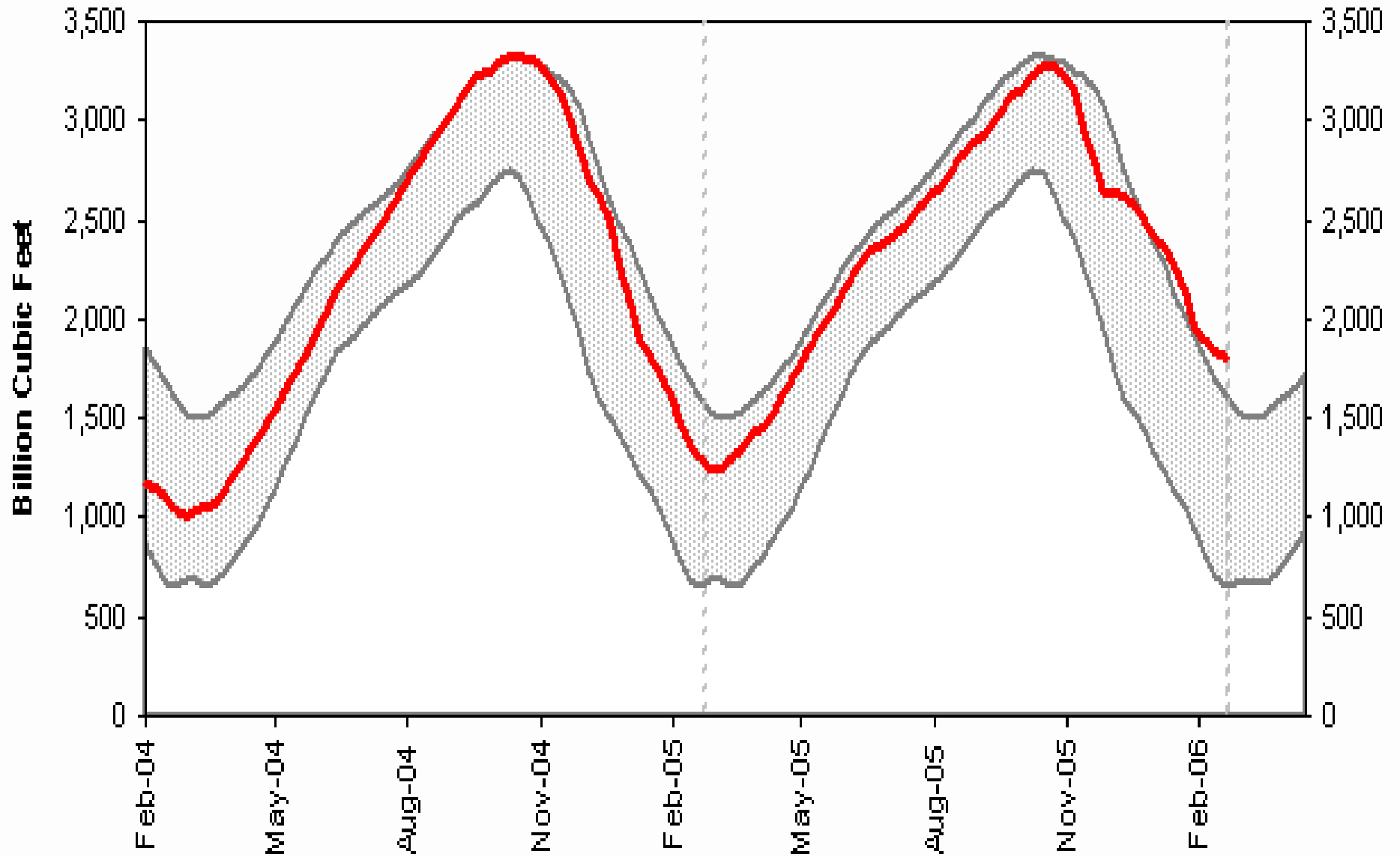
Source: EIA

# Shut-In Federal Offshore Gulf Natural Gas Production

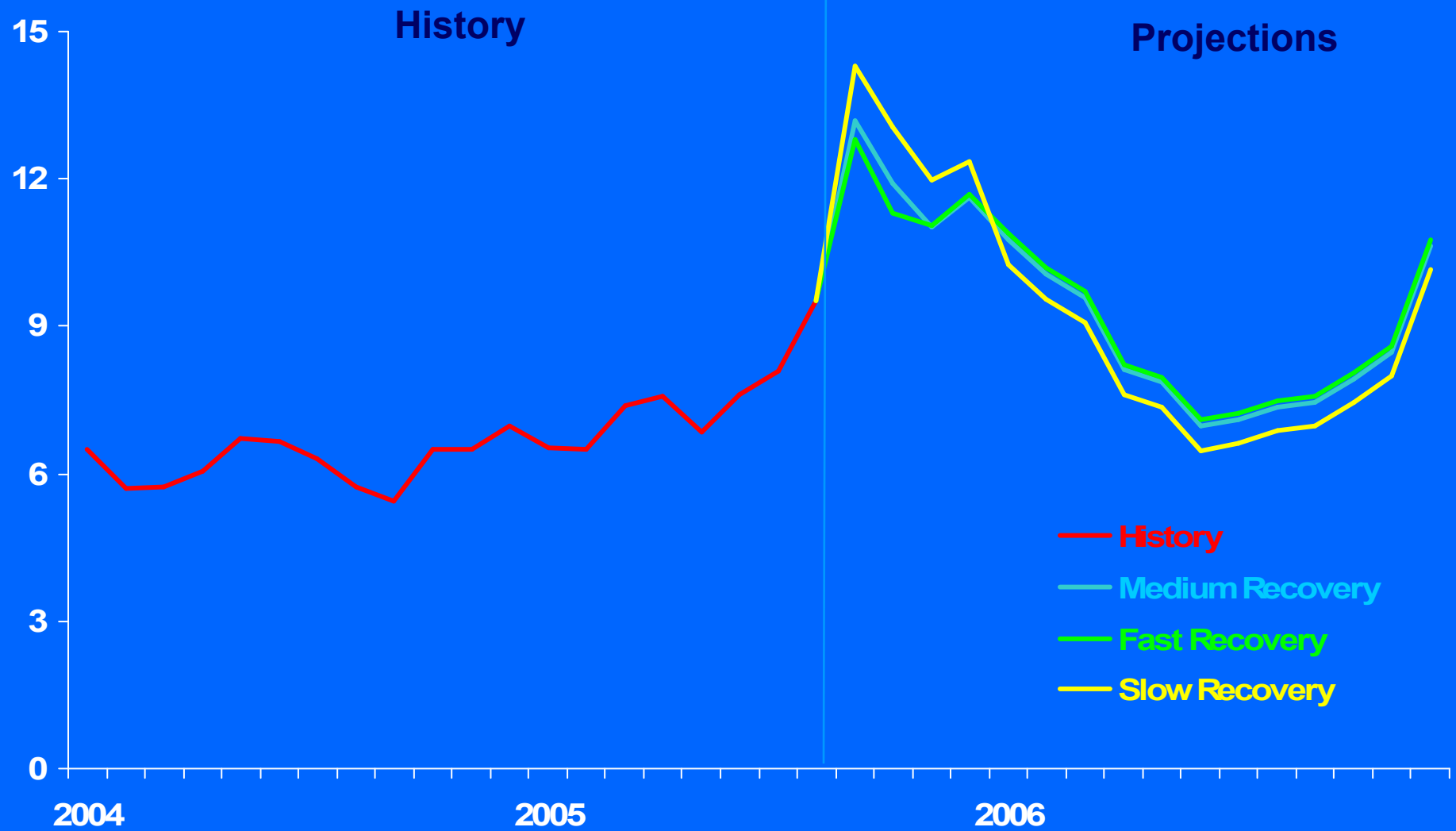


\* Trading on Henry Hub suspended from 9/23 – 10/6

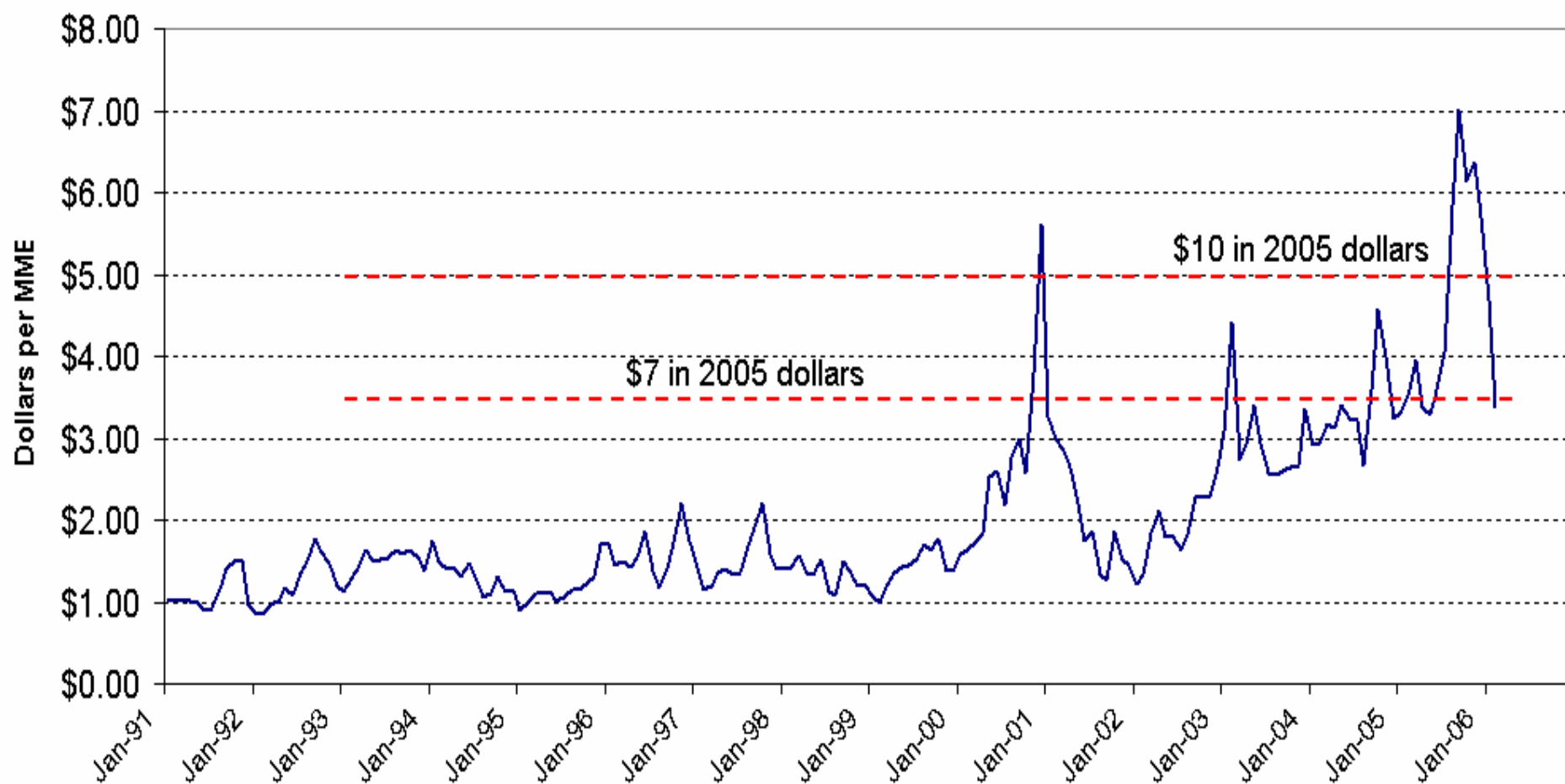
# NG stocks are above average



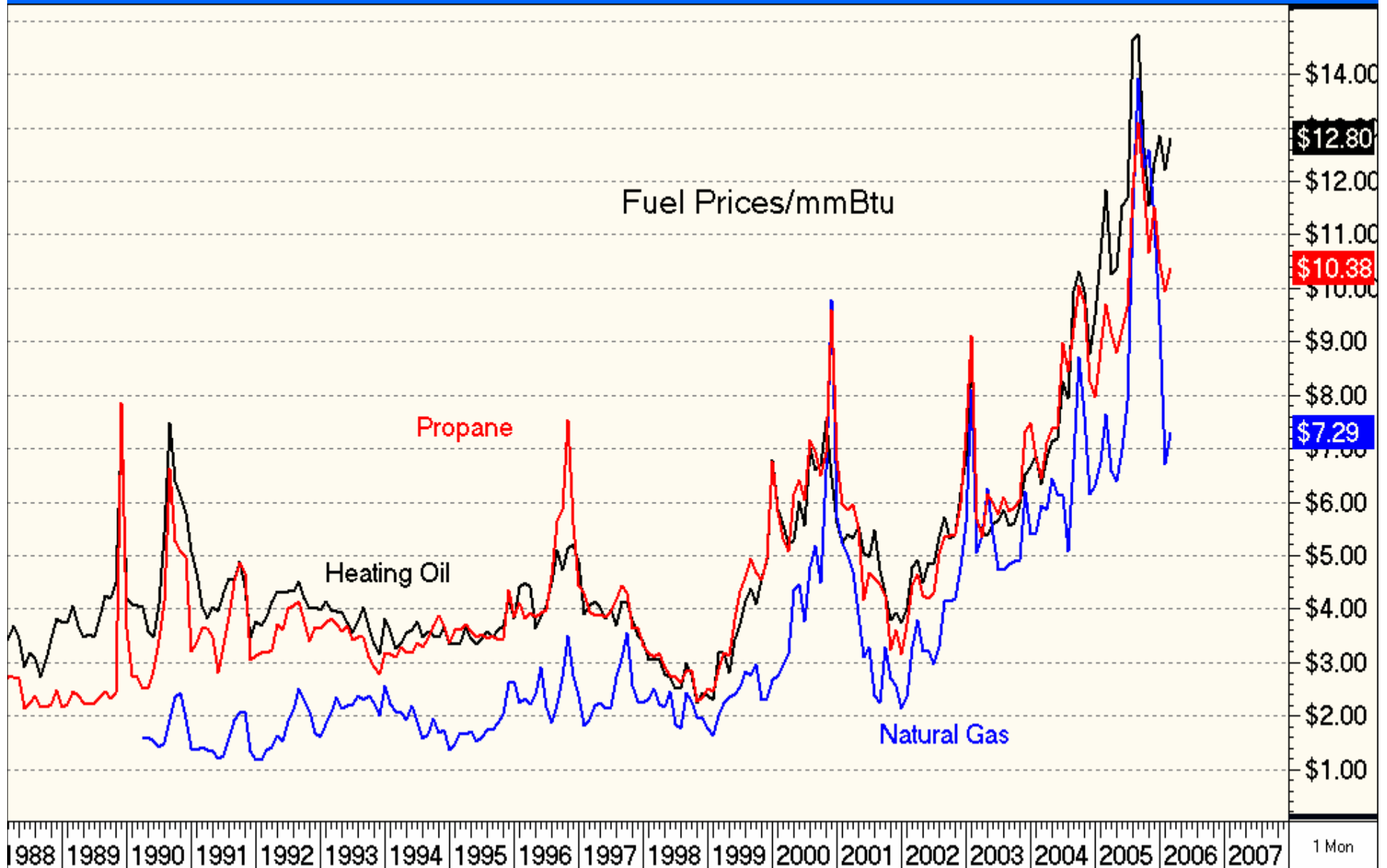
# Natural Gas Spot Price, 2004-2006 (dollars per thousand cubic feet)



## NYMEX Natural Gas in Constant 1984 Dollars (Adjusted by Bureau of Labor Statistics Consumer Price Index)



# Comparative Fuel Prices



# Natural Gas Outlook

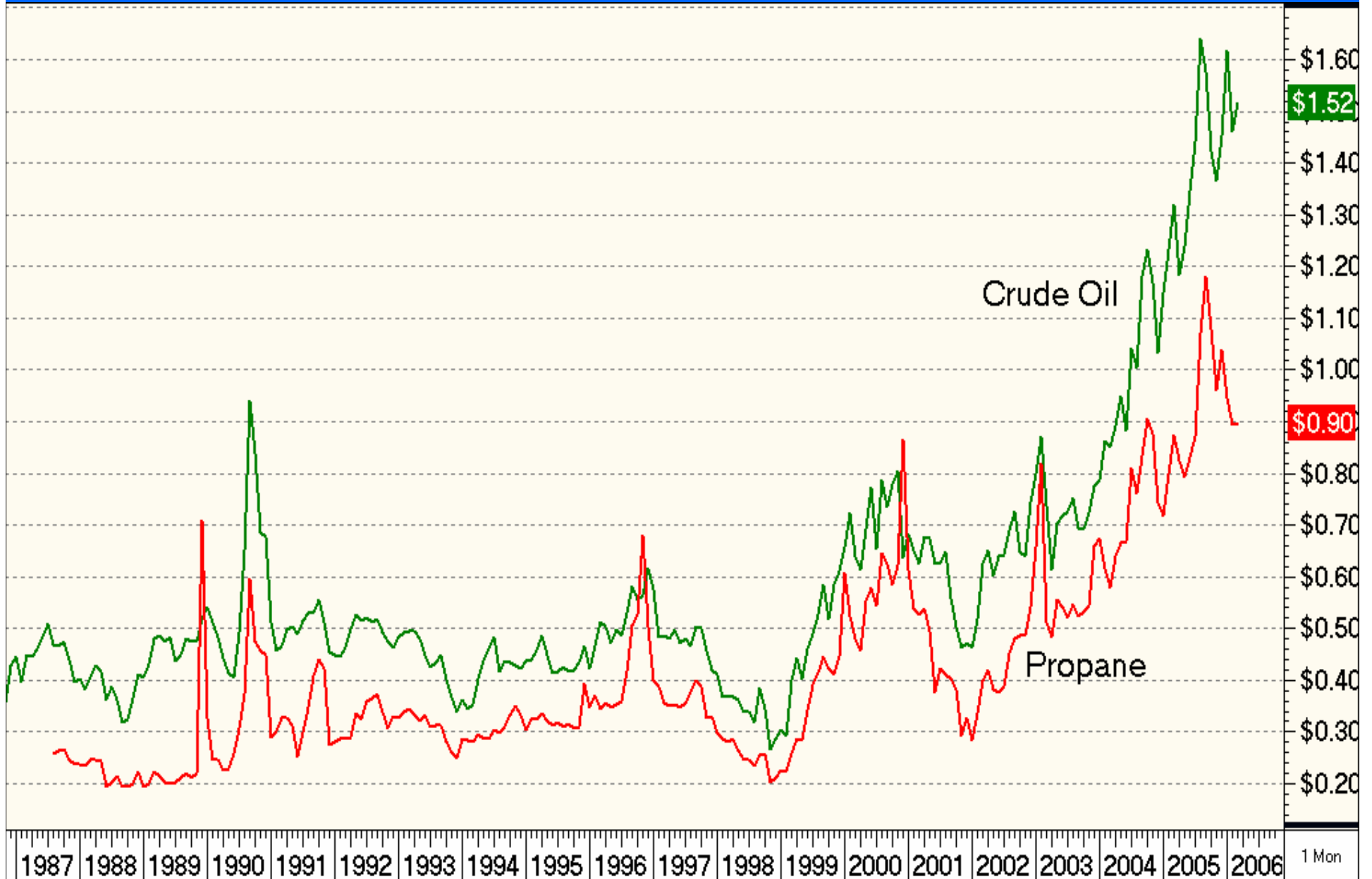
- The hurricanes' effect on output was less than feared, plus winter was mild.
- Stocks are high, 60% above average.
- Spreads are record wide, encouraging more storage.
- LNG is the only way to expand imports, but building infrastructure will take time.
- NG now at record discount to HO, crude oil (over \$5/mmbtu).
- Prices will remain volatile, but less than last year.

# The Propane Market

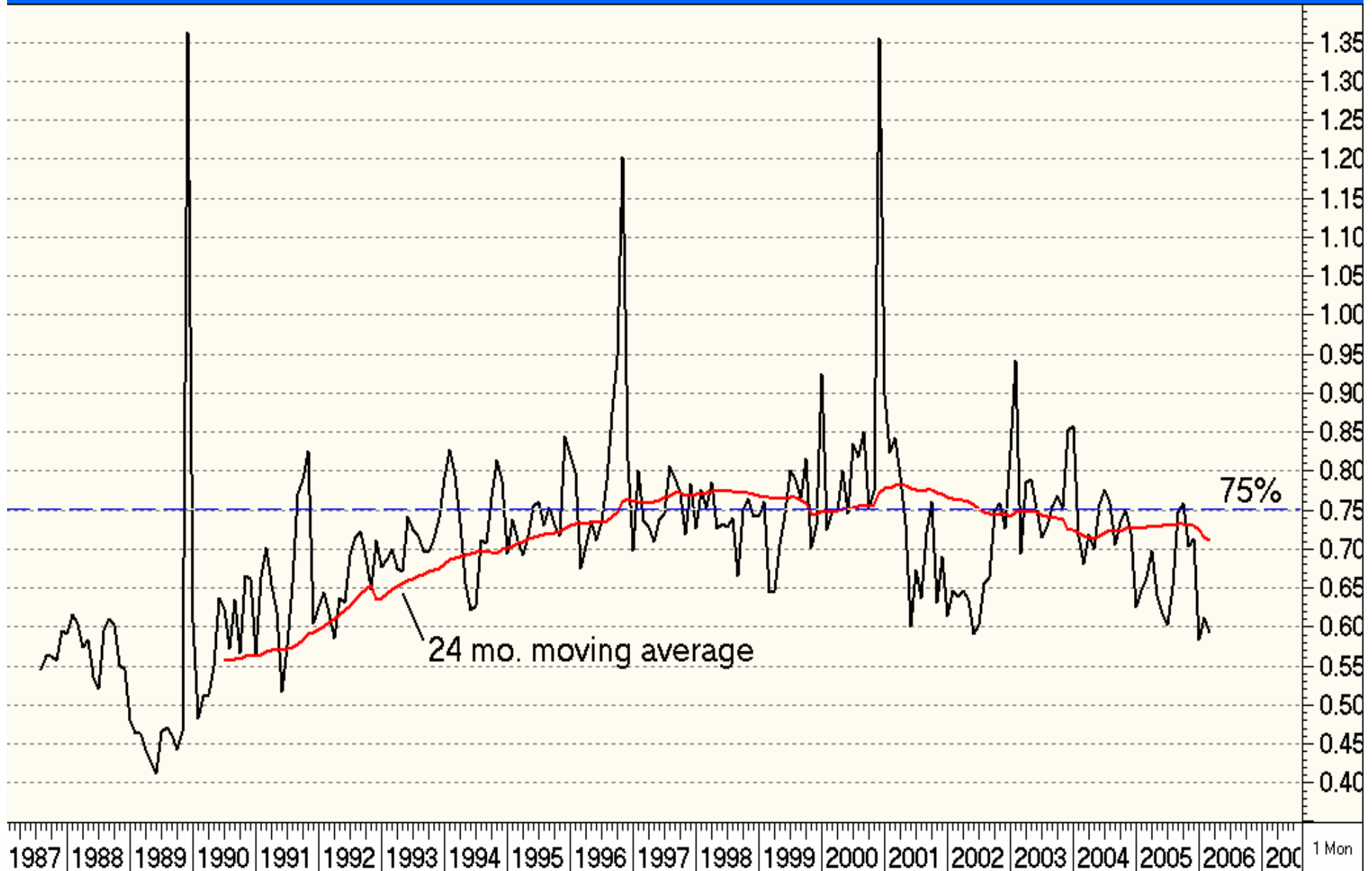
# Propane Price Factors

- crude and natural gas prices
- inventories
- refinery & gas plant production
- weather
- petrochemical demand
- imports

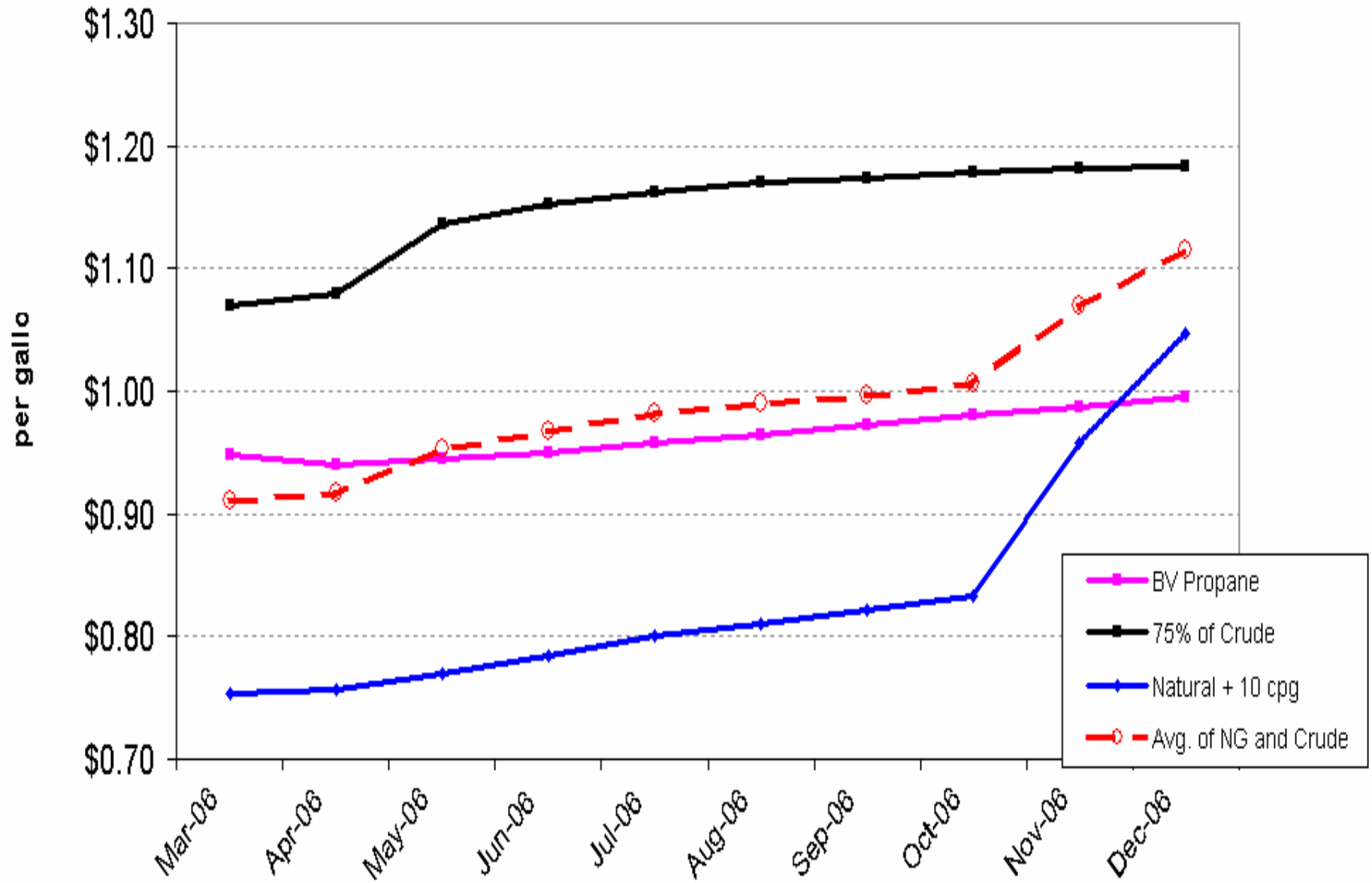
# Propane tends to follow Crude



# Propane as a % of Crude



# Forward Price Curves

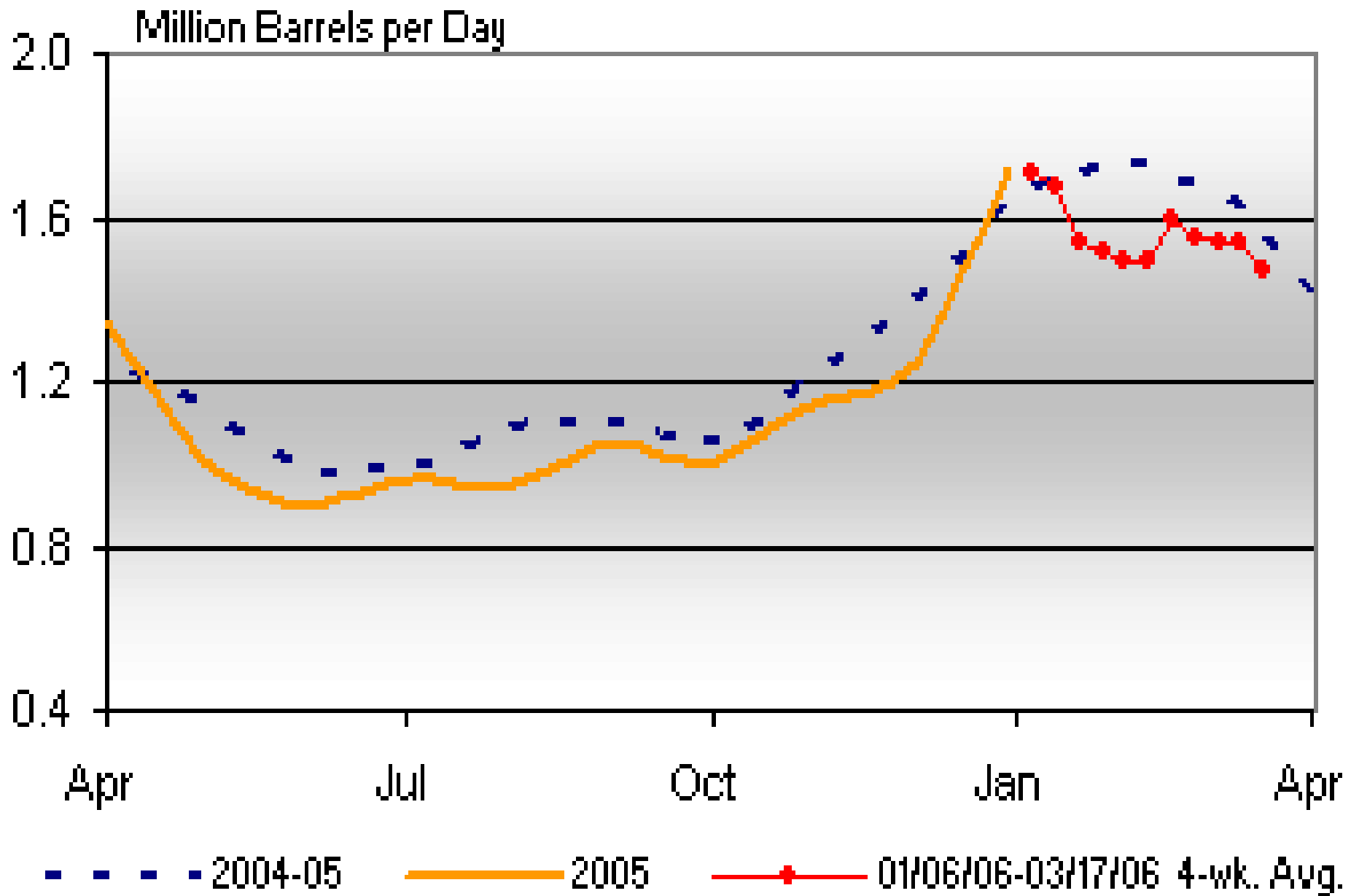




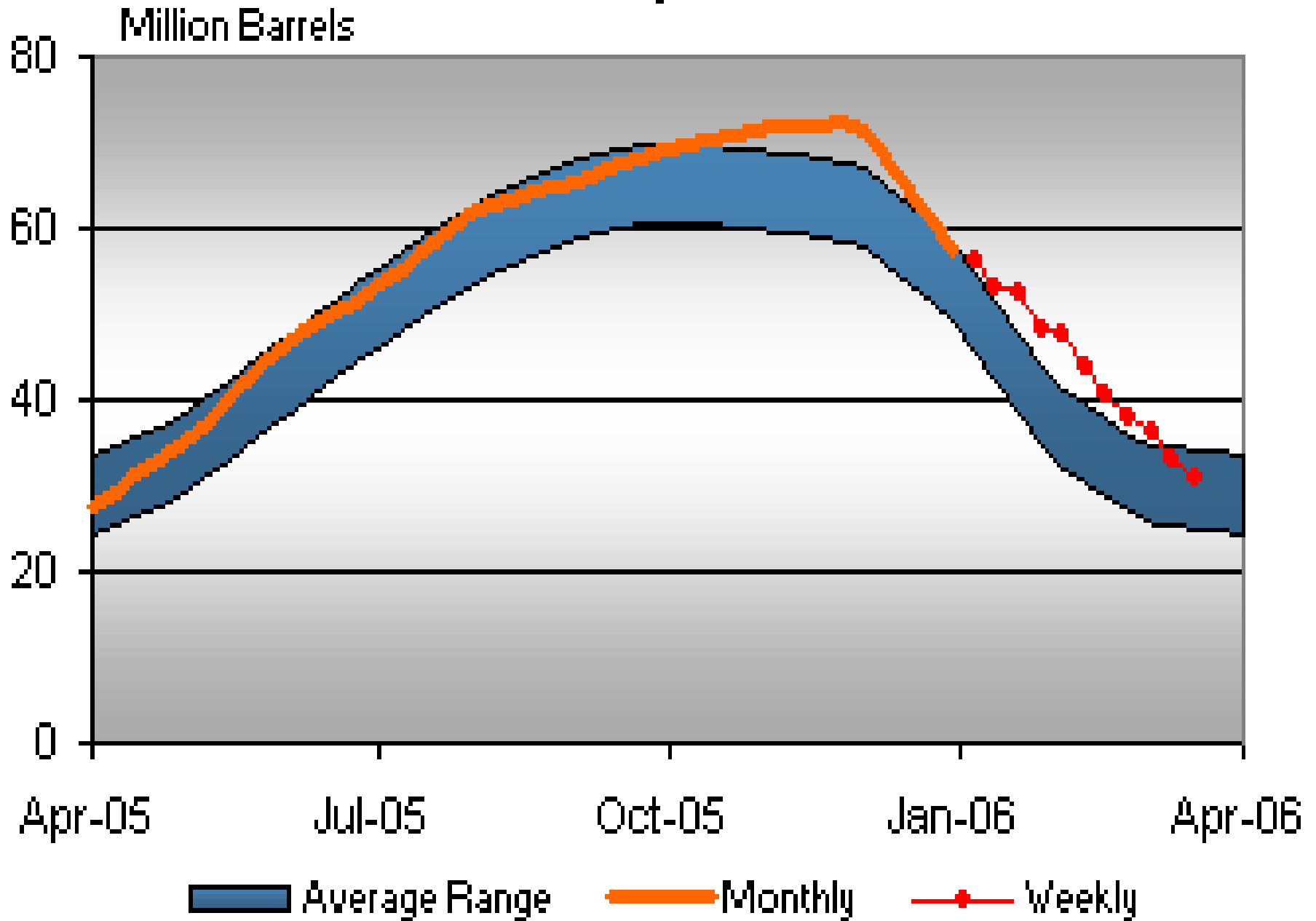
# Propane value vs. Natural Gas

			margin/gal	
<b>NG Price</b>	\$ -	\$ 0.05	\$ 0.10	
\$ 7.00	\$ 0.631	\$ 0.681	\$ 0.731	
\$ 8.00	\$ 0.721	\$ 0.771	\$ 0.821	
\$ 9.00	\$ 0.811	\$ 0.861	\$ 0.911	
\$ 10.00	\$ 0.901	\$ 0.951	\$ 1.001	
\$ 11.00	\$ 0.991	\$ 1.041	\$ 1.091	
\$ 12.00	\$ 1.081	\$ 1.131	\$ 1.181	
\$ 13.00	\$ 1.171	\$ 1.221	\$ 1.271	
\$ 14.00	\$ 1.261	\$ 1.311	\$ 1.361	

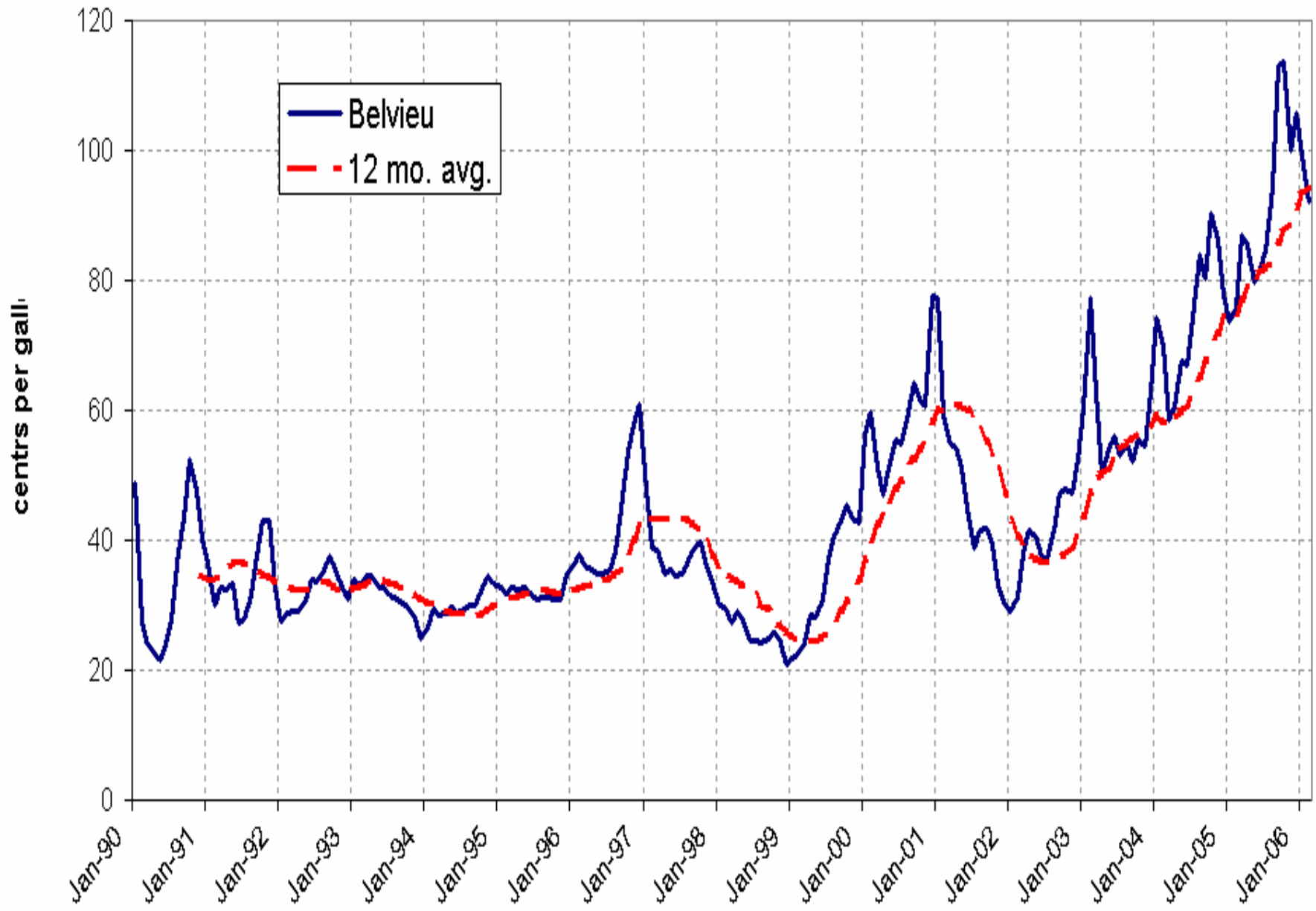
# U.S. Propane Demand



# U.S. Propane Stocks



### Belvieu Monthly Average Jan 90 - Feb 06



## NYMEX Propane in Constant 1984 Dollars (Adjusted by Bureau of Labor Statistics Consumer Price Index)



# Propane Outlook

- Stocks are comfortable as heating season ends, thanks to mild winter and strong imports.
- Prices are high, but so are the alternatives.
- Propane is cheap relative to crude.
- Price will continue to be driven by crude and natural prices

# Apr 06 - 06/07 Low Price Case

- global economy slumps
- weather is mild
- no "event shocks", Mideast stabilizes
- dollar firms
- no crude supply interruptions
- crude is \$45-55
- diesel is \$1.30-1.80 (pre-tax)
- gasoline is \$1.30-1.80
- natural gas is \$6.50-8.50
- propane is 70-90 cpg

## Apr 06 - 06/07 Medium Price Case

- global economy is stable
- normal weather
- OPEC maintains high output
- dollar stabilizes
- only mild event shock(s)
- crude is \$55-65
- diesel is \$1.55-2.00
- gasoline is \$1.55-2.00
- natural gas is \$7.50-10.00
- propane is \$.90-1.20

# Apr 06 - 06/07 High Price Case

- global economy is strong
- severe weather in the U.S. and Europe
- mideast turmoil intensifies
- crude supply interruptions
- dollar is weaker
- crude is \$65-80
- HO is \$1.90-2.50
- gasoline is \$1.90-2.50
- natural gas is \$10-14
- Propane is \$1.10-1.50