

EIA's Winter Fuels Outlook

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**National Capital Area Chapter –
International Association of Energy
Economists**

Washington, DC

U.S. Average Winter Fuel Expenditures Are Expected To Be Significantly Higher

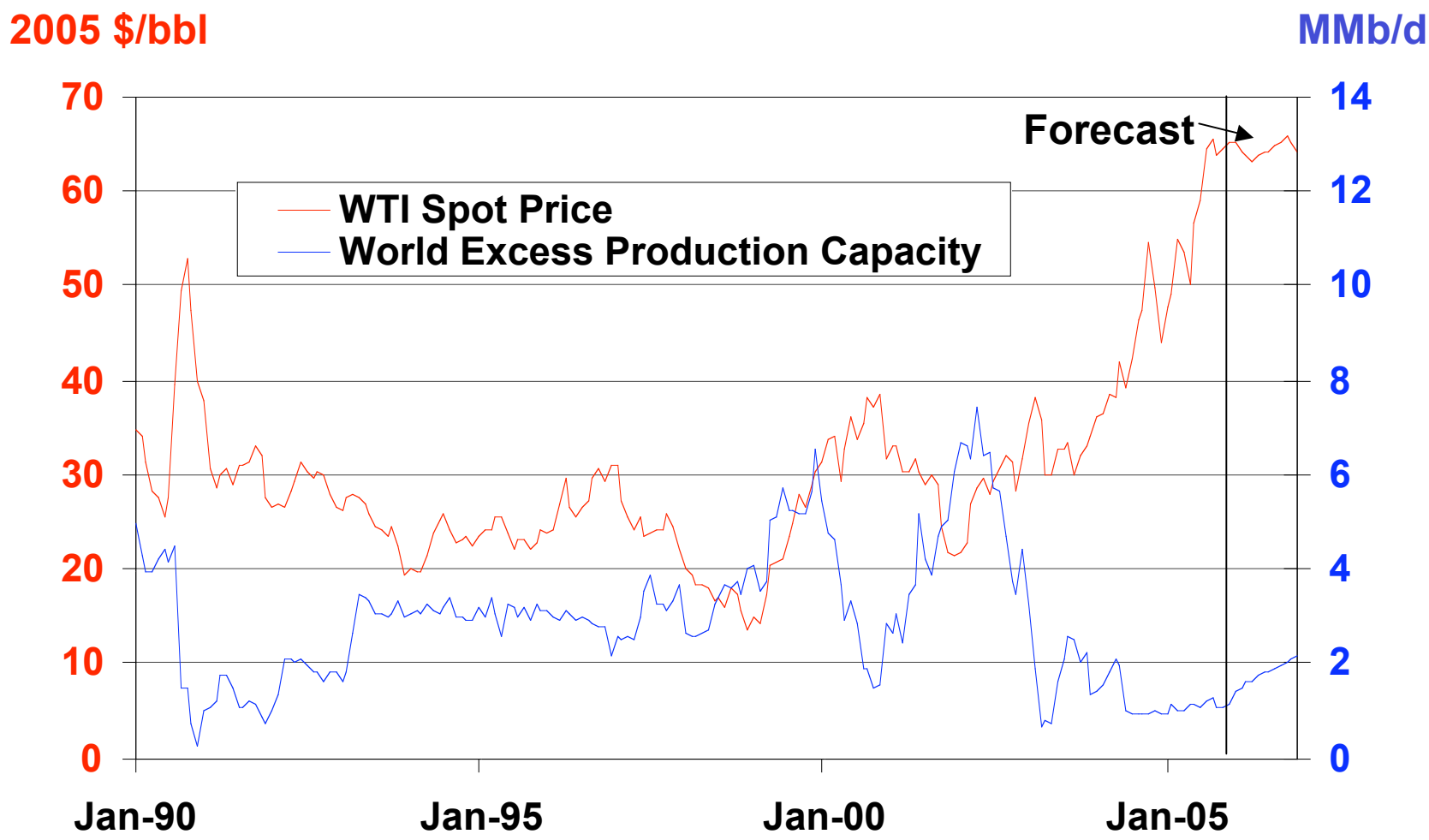
| Fuel | Winter of | | Winter of 05-06 | | | % Change from last Winter | | |
|-----------------------------|---------------|-------|-----------------|-------|--------|---------------------------|------|--------|
| | Average 99-04 | 04-05 | Warmer | Base | Colder | Warmer | Base | Colder |
| Natural Gas | | | | | | | | |
| Price (\$/mcf*) | 8.41 | 11.13 | 15.32 | 15.95 | 16.68 | 37.7 | 43.4 | 49.9 |
| Expenditures (\$) | 586 | 742 | 964 | 1,096 | 1,242 | 29.8 | 47.6 | 67.3 |
| Heating Oil | | | | | | | | |
| Price (\$/gallon) | 1.35 | 1.92 | 2.34 | 2.54 | 2.80 | 21.7 | 32.0 | 45.4 |
| Expenditures (\$) | 865 | 1,199 | 1,326 | 1,577 | 1,893 | 10.6 | 31.5 | 57.9 |
| Propane | | | | | | | | |
| Price (\$/gallon) | 1.29 | 1.64 | 1.91 | 2.05 | 2.25 | 16.0 | 24.8 | 37.0 |
| Expenditures (\$) | 885 | 1,102 | 1,215 | 1,427 | 1,700 | 10.3 | 29.5 | 54.3 |
| Electricity | | | | | | | | |
| Price (\$/kwh**) | 0.08 | 0.09 | 0.09 | 0.09 | 0.09 | 3.4 | 3.4 | 3.3 |
| Expenditures (\$) | 685 | 717 | 719 | 755 | 791 | 0.3 | 5.4 | 10.4 |
| Average Expenditures | 668 | 786 | 929 | 1,044 | 1,176 | 18.1 | 32.9 | 49.6 |

Expenditures are based on typical per-household consumption.
 * thousand cubic feet, ** kilowatthour

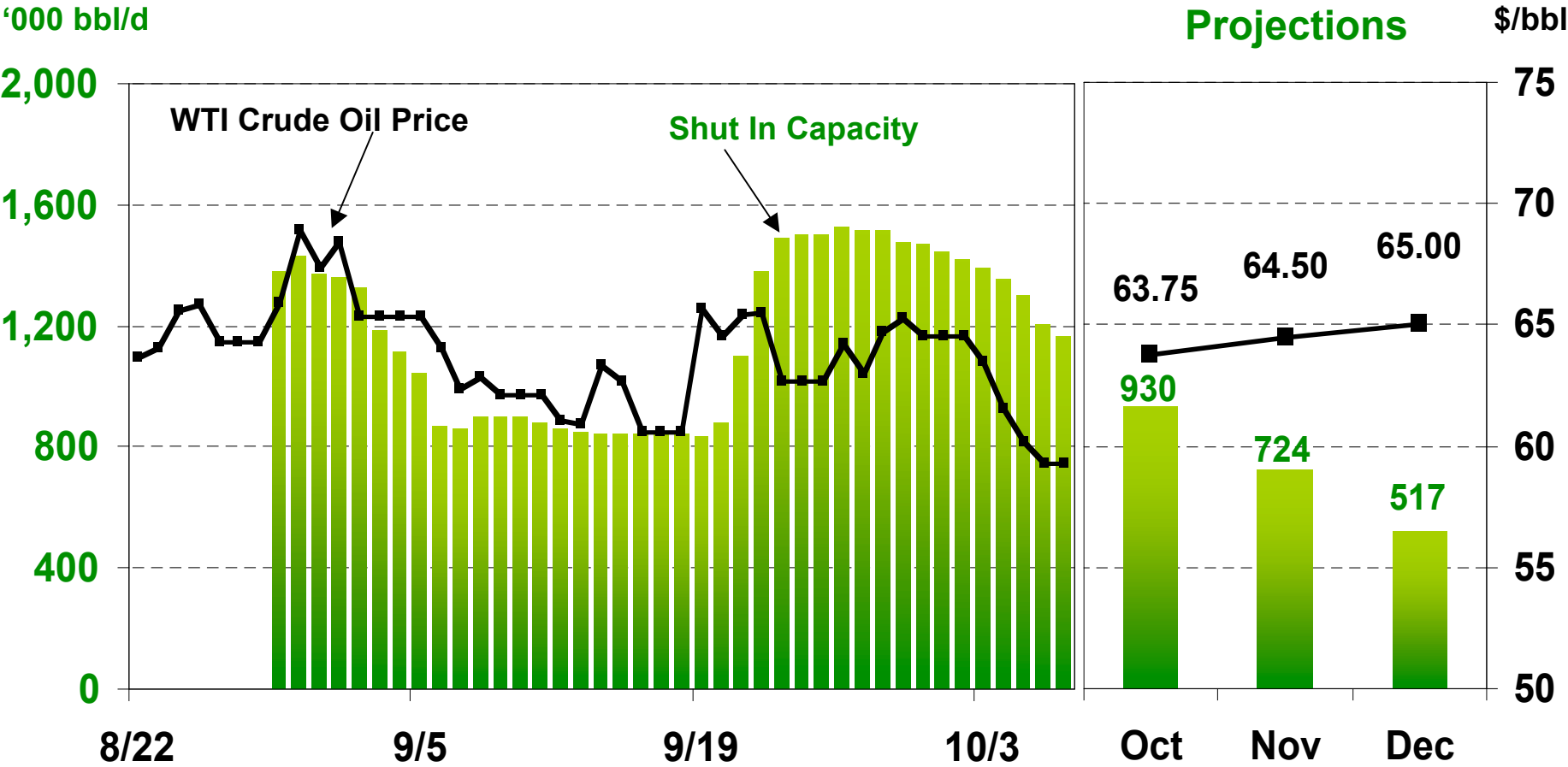
Several Factors Are Driving Higher Expenditures

- International factors such as low spare crude oil capacity and political tensions contribute to uncertainty and low supply growth for crude oil.
- Recent hurricanes and associated disruptions exacerbate already tight markets in oil, petroleum products, and natural gas.
- NOAA predicts colder weather nationally for the 2005/06 winter – 3.2% colder than last winter and 0.4% colder than the 30-year average.

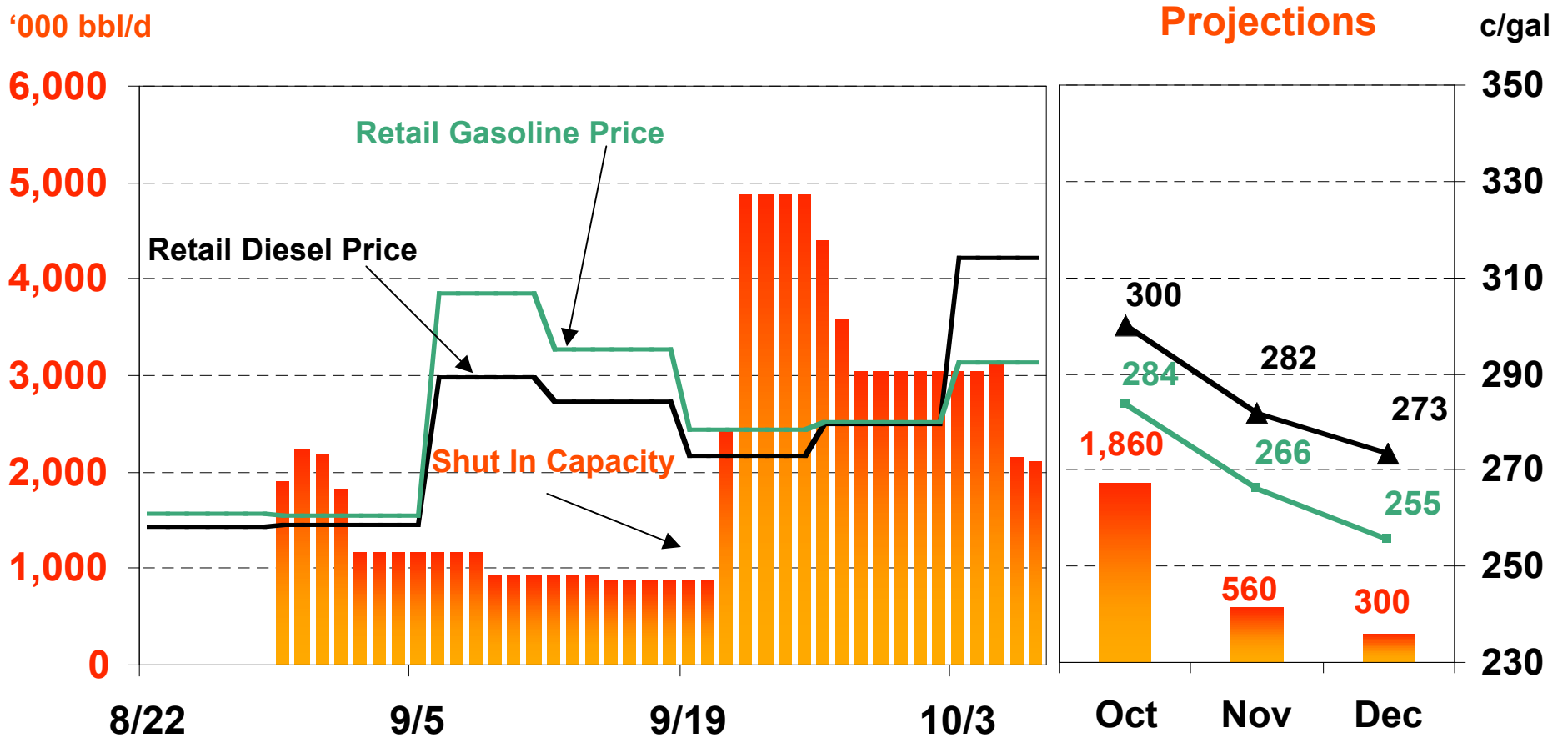
Tight Global Markets Result in High Crude Prices and Strained Supply



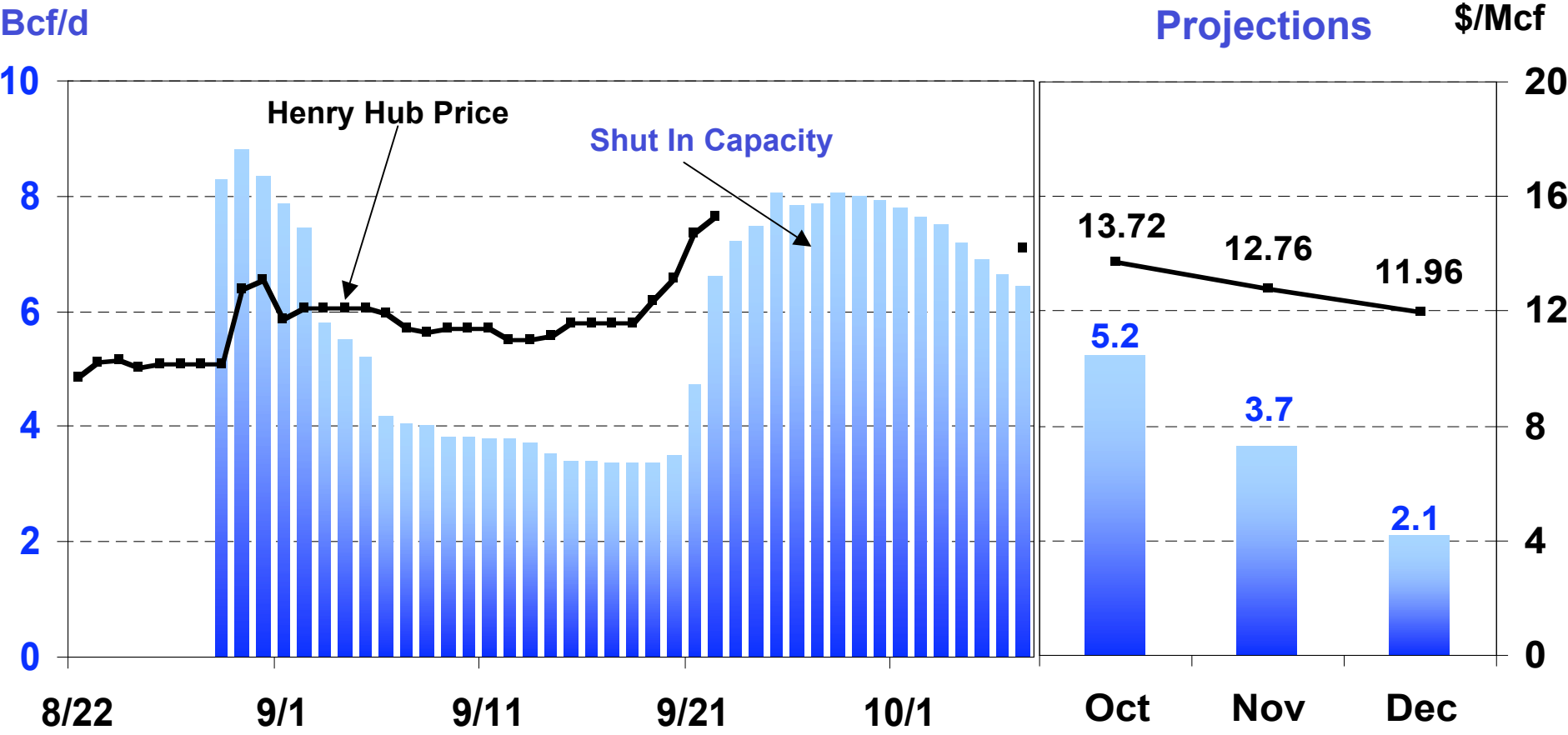
Hurricanes Katrina and Rita Shut In Significant Gulf Crude Oil Production



Hurricanes Katrina and Rita Initially Shut Down Most Gulf Refinery Capacity

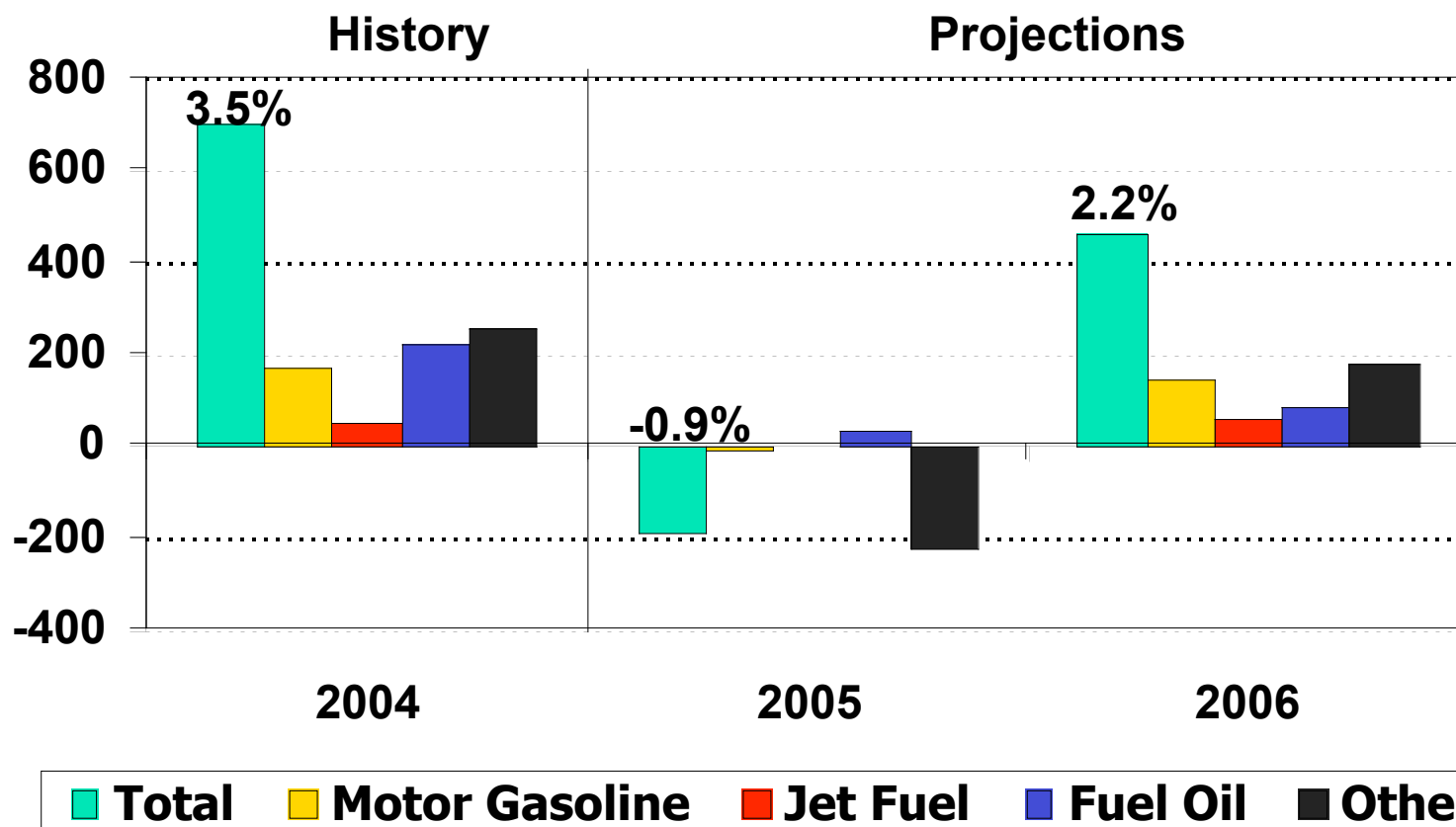


Hurricanes Katrina and Rita Shut In Significant Gulf Natural Gas Production

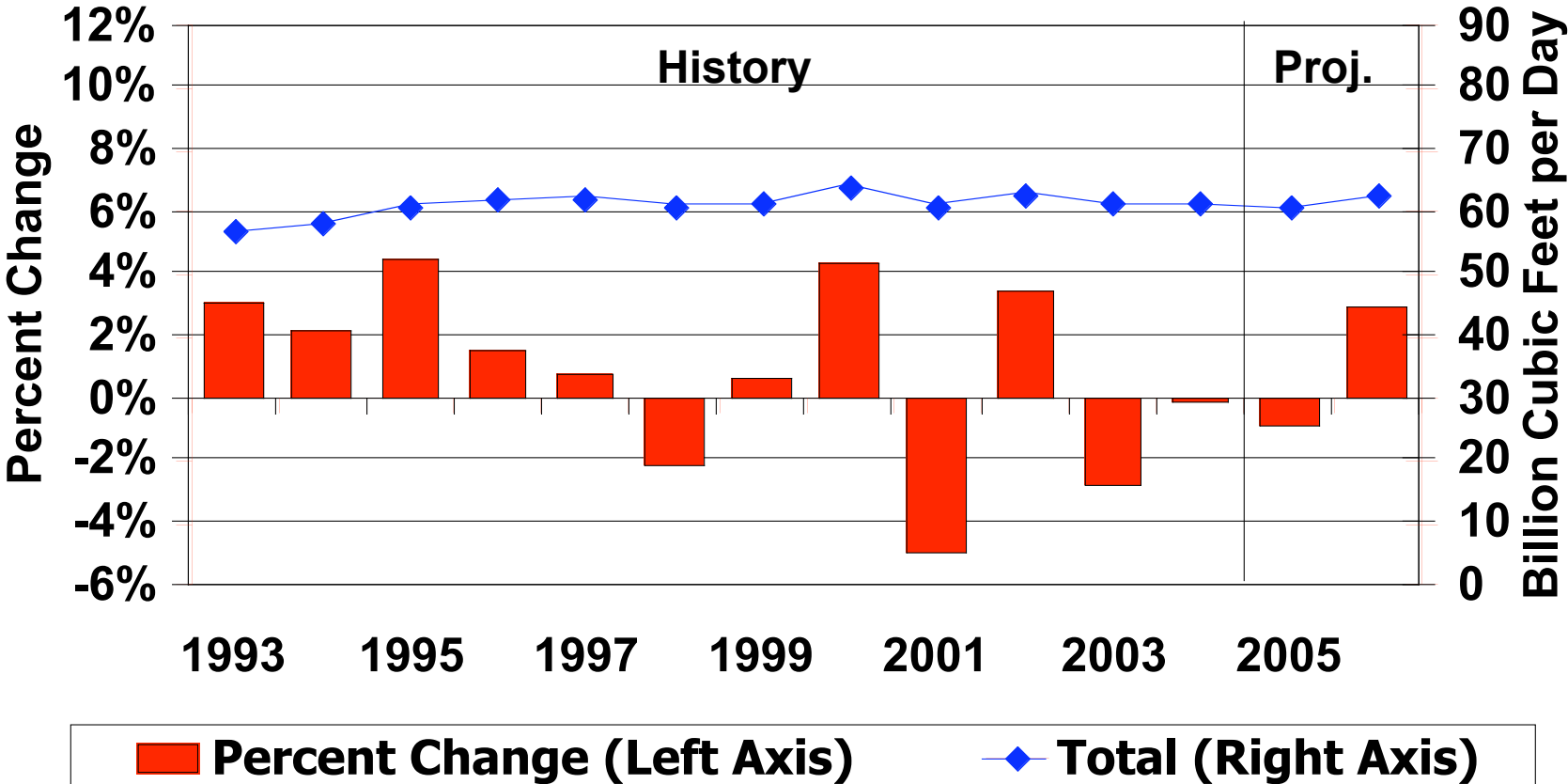


U.S. Petroleum Products Demand Growth (Change from Previous Year)

'000 bbl/d

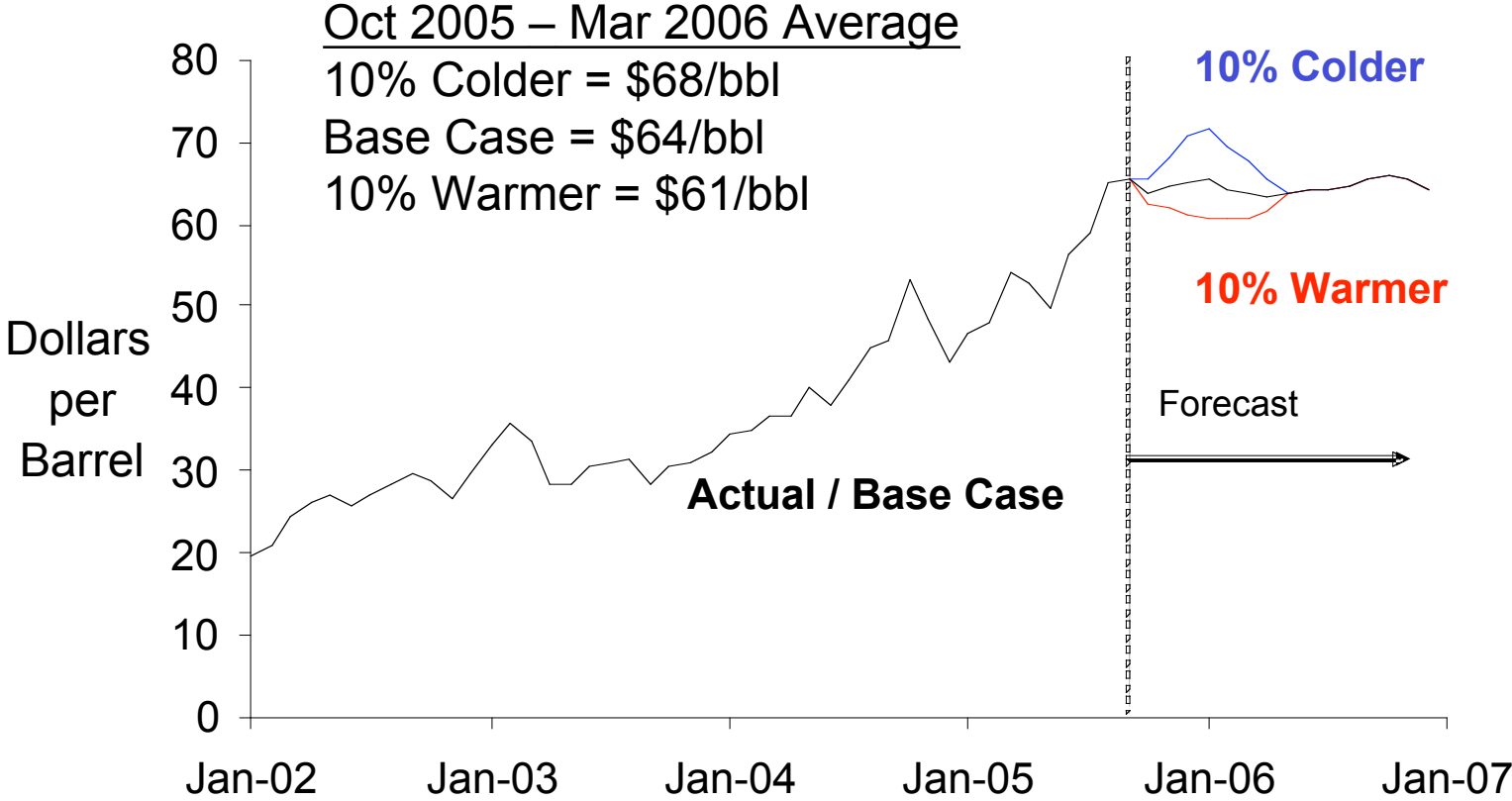


Total U.S. Natural Gas Demand Growth



WTI* Crude Oil Price

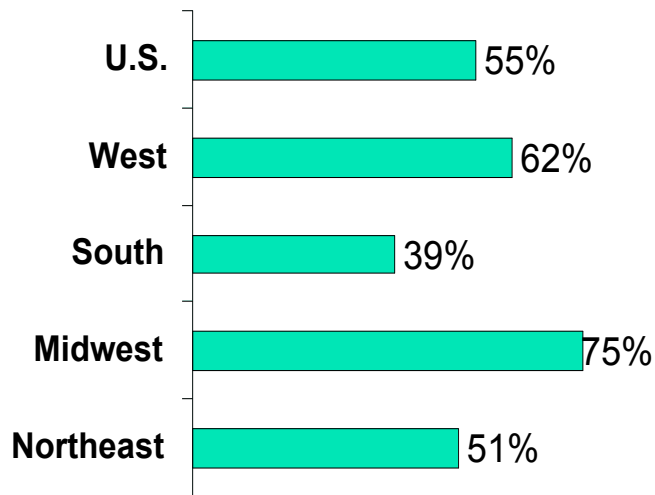
Baseline, Colder, Warmer Cases



* West Texas Intermediate

Natural Gas Heating Bills Are Projected to Rise by Between 32% and 61%

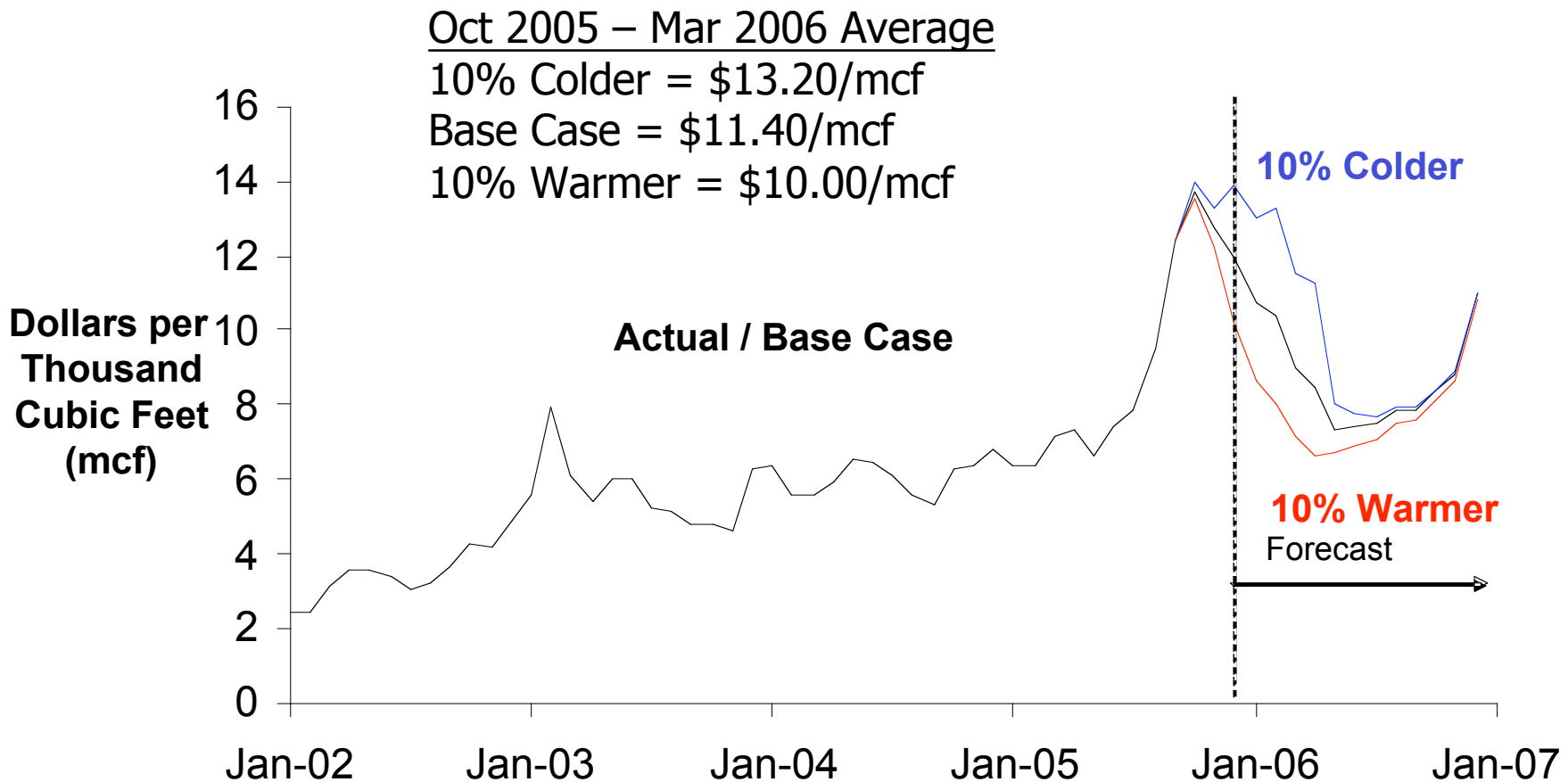
Households using natural gas as primary heating fuel



% Change from Last Winter (Projected)

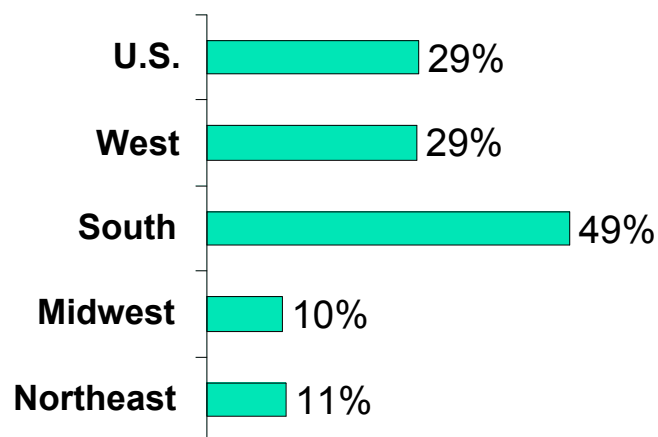
| | Consumption | Average Price | Total Expenditures |
|-----------|-------------|---------------|--------------------|
| West | + 4 % | + 29 % | + 34 % |
| South | + 5 % | + 48 % | + 56 % |
| Midwest | + 4 % | + 55 % | + 61 % |
| Northeast | - 1 % | + 33 % | + 32 % |

Natural Gas Spot Prices (Henry Hub): Baseline, Warmer, Colder Cases



Winter Electricity Expenditures Are Projected Up By Less Than 4%, Except in the South

Households using electricity as primary heating fuel

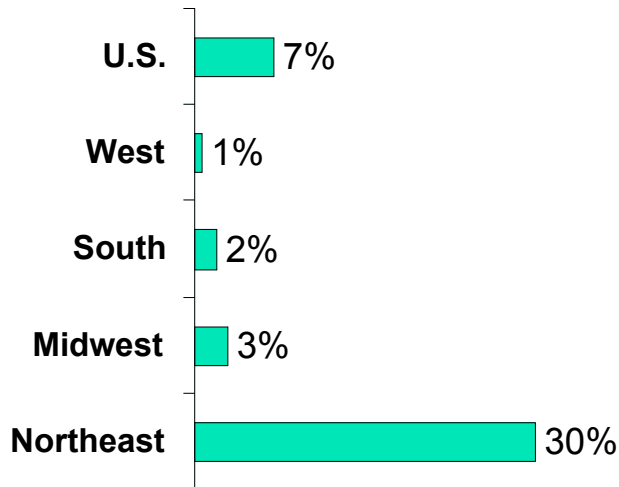


% Change from Last Winter (Projected)

| | Consumption | Average Price | Total Expenditures |
|-----------|-------------|---------------|--------------------|
| West | + 2 % | + 2 % | + 4 % |
| South | + 3 % | + 7 % | + 9 % |
| Midwest | + 3 % | + 0 % | + 3 % |
| Northeast | - 1 % | + 3 % | + 2 % |

Winter Heating Oil Expenditures Are Projected to Increase by Over 30%

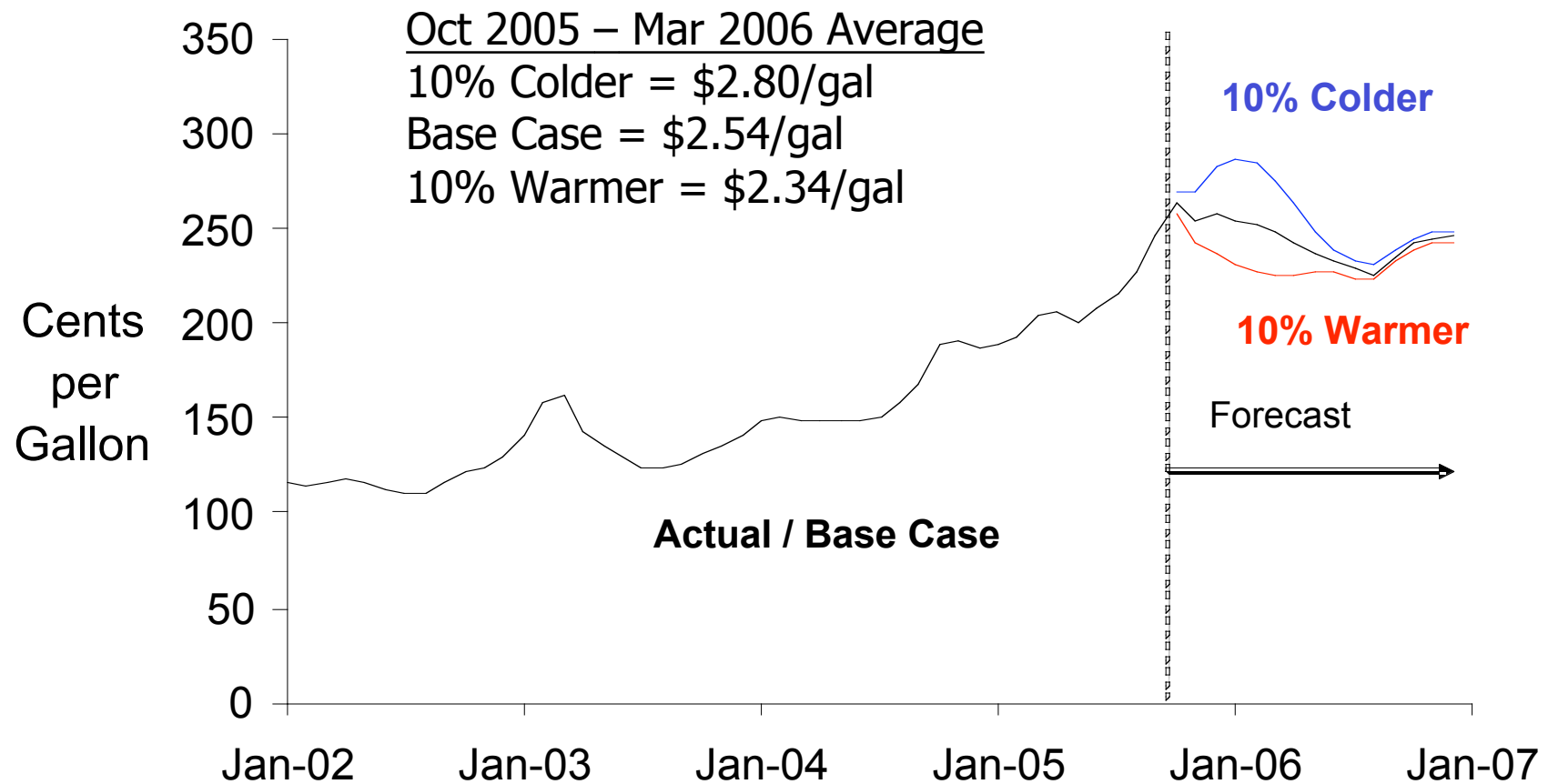
Households using heating oil as primary heating fuel



% Change from Last Winter (Projected)

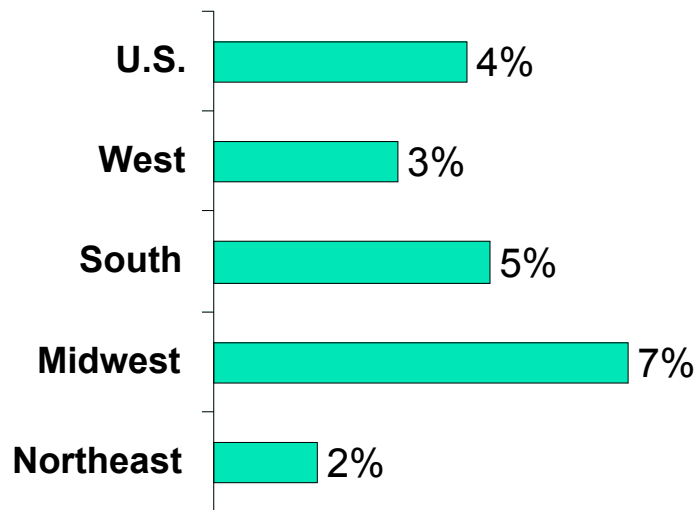
| | Consumption | Average Price | Total Expenditures |
|-----------|-------------|---------------|--------------------|
| West | + 3 % | + 33 % | + 37 % |
| South | + 2 % | + 31 % | + 33 % |
| Midwest | + 5 % | + 34 % | + 41 % |
| Northeast | - 2 % | + 32 % | + 30 % |

Retail Heating Oil Prices: Baseline, Colder, Warmer Cases



Propane Expenditures Are Projected Up by 20% to 36% This Winter

Households using propane as primary heating fuel



% Change from Last Winter (Projected)

| | Consumption | Average Price | Total Expenditures |
|-----------|-------------|---------------|--------------------|
| West | + 4 % | + 22 % | + 27 % |
| South | + 5 % | + 23 % | + 29 % |
| Midwest | + 5 % | + 30 % | + 36 % |
| Northeast | - 1 % | + 21 % | + 20 % |

Conclusions

- These projections are subject to considerable uncertainty, depending in part on the rate of recovery in the Gulf of Mexico.
- The average U.S. household will pay about \$260 more for heating this winter, mostly due to already tight supplies and the effects of the Gulf coast hurricanes.
- Under the baseline forecast, natural gas expenditures could be about \$350 (48%) higher for the average U.S. household this winter but 61% higher in the Midwest. Heating oil expenditures are projected be about \$380 (32%) higher for the average U.S. household this winter.
- A winter that is colder than expected could substantially raise estimated expenditure increases. A 10% colder winter would raise the projected expenditure increases to 67% for natural gas and 58% for heating oil.

Modeling Issues: Last Years Accomplishments – Regional Short Term Model

- Regionalized:
 - Macroeconomic information (9 Census Divisions)
 - Household characteristics, incl. energy (9 Census Divisions)
 - Weather/degree-days (9 Census Divisions)
 - Electricity Demand (9 Census Divisions plus selected States)
 - Electricity Supply (9 Census Divisions plus selected States)
 - Electricity Delivered Prices ((9 Census Divisions plus selected States)
 - Natural Gas Supply (Alaska, Gulf of Mexico, Other)
 - Natural Gas Demand (9 Census Divisions)
 - Natural Gas Delivered Prices (9 Census Divisions)
 - U.S. Oil Production (Alaska, Gulf of Mexico, Other)
 - Petroleum Prices (gasoline, heating oil, propane): 4 Census Regions or 5 PADD Regions
 - Inventories (gasoline, distillate, propane): 5 PADD Regions

Short-Term Energy Outlook Winter Forecasting Error

| Variable | Average Absolute Error | Average Absolute Percent Error |
|---|-------------------------------|---------------------------------------|
| West Texas Intermediate Crude Oil Price (\$/bbl) | \$2.44 per barrel | 11% |
| Heating Oil Price (cents/gallon) | 4.83 cents per gallon | 5% |
| Residential Natural Gas Price (\$/mcf) | \$ 0.49 per mcf | 7% |
| U.S. Total Petroleum Demand (MMBD) | 0.01 MMBD | 0.0% |
| Distillate Fuel Demand (MMBD) | 0.01 MMBD | 0.0% |
| Residential Natural Gas Demand (bcf/day) | 0.1 bcf per day | 1% |

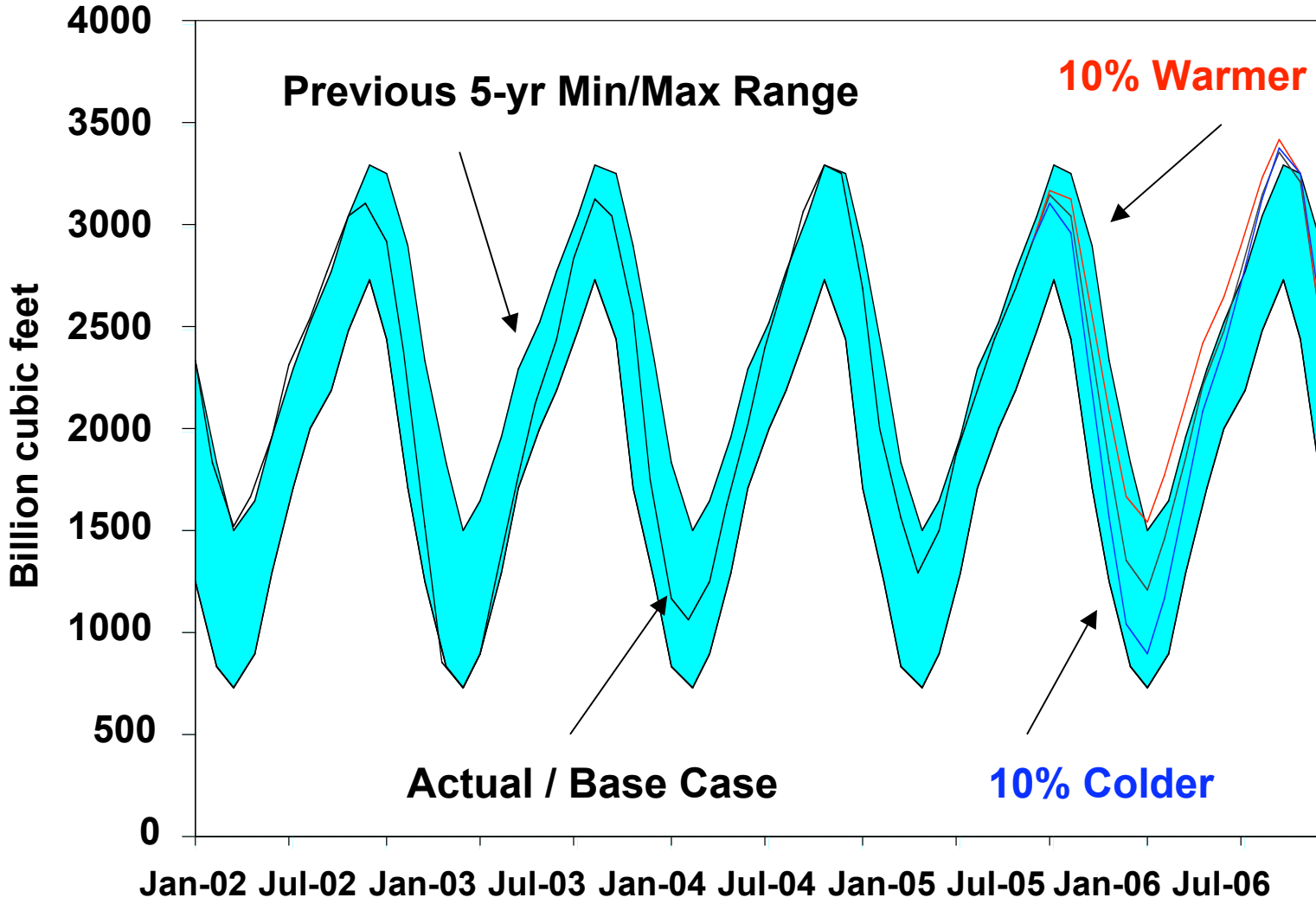
Future Emphasis: Short-Term Analysis Forecasting Issues ?

- International oil market events including disruption analysis?
- Weather be it cold, hot or events such as hurricanes?
- Economic growth trends by detailed industry?
- Refinery disruptions both in the U.S. and worldwide?
- Natural gas market analysis?
- Electricity market analysis?

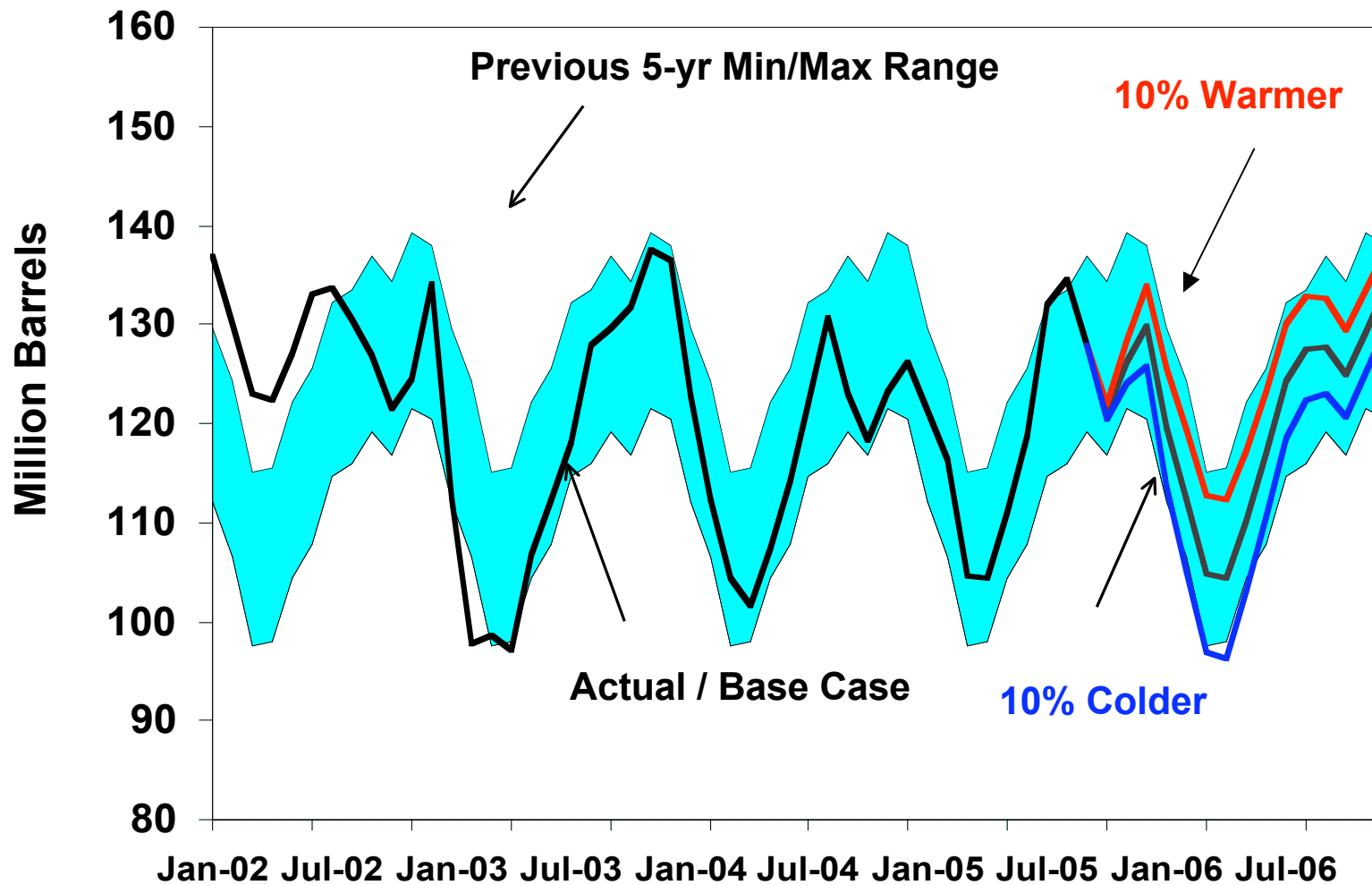
Additional Charts for Reference

- **Natural Gas Storage**
- **U.S. Distillate Stocks**
- **Retail Diesel Prices**
- **Propane Stocks**
- **Propane Residential Prices**
- **Gasoline Prices (Real/Nominal)**
- **Retail Gasoline Prices**
- **Retail Gasoline Prices by PADD**
- **Gasoline Stocks**
- **Jet Fuel Prices**
- **Jet Fuel Stocks**
- **U.S Annual Energy Expenditures**
- **Per Household Heating Expenditures**
- **World Oil Demand Growth**

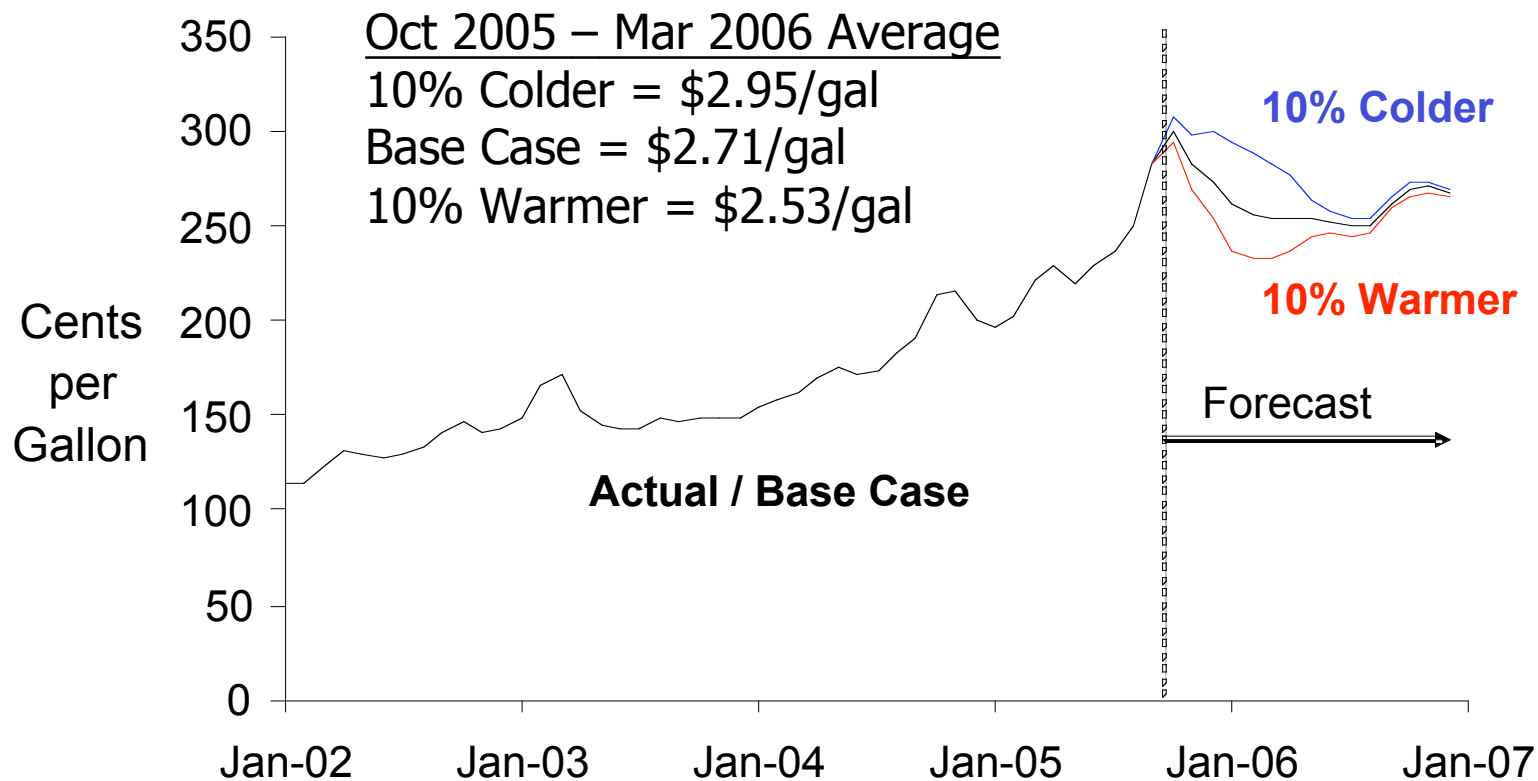
U.S. Natural Gas in Storage: Baseline, Warmer, Colder Cases



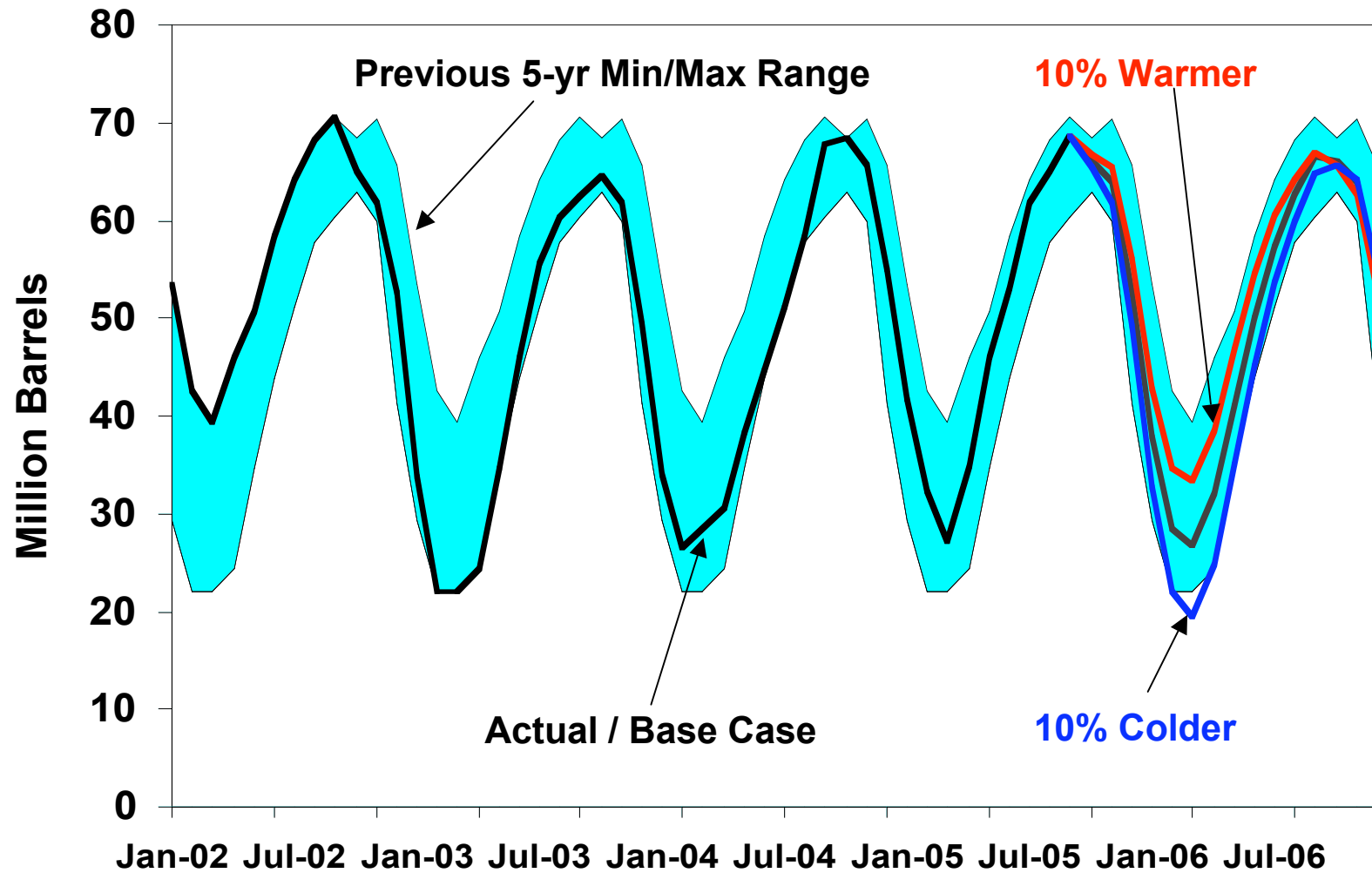
Distillate Inventories: Baseline, Warmer, Colder Cases



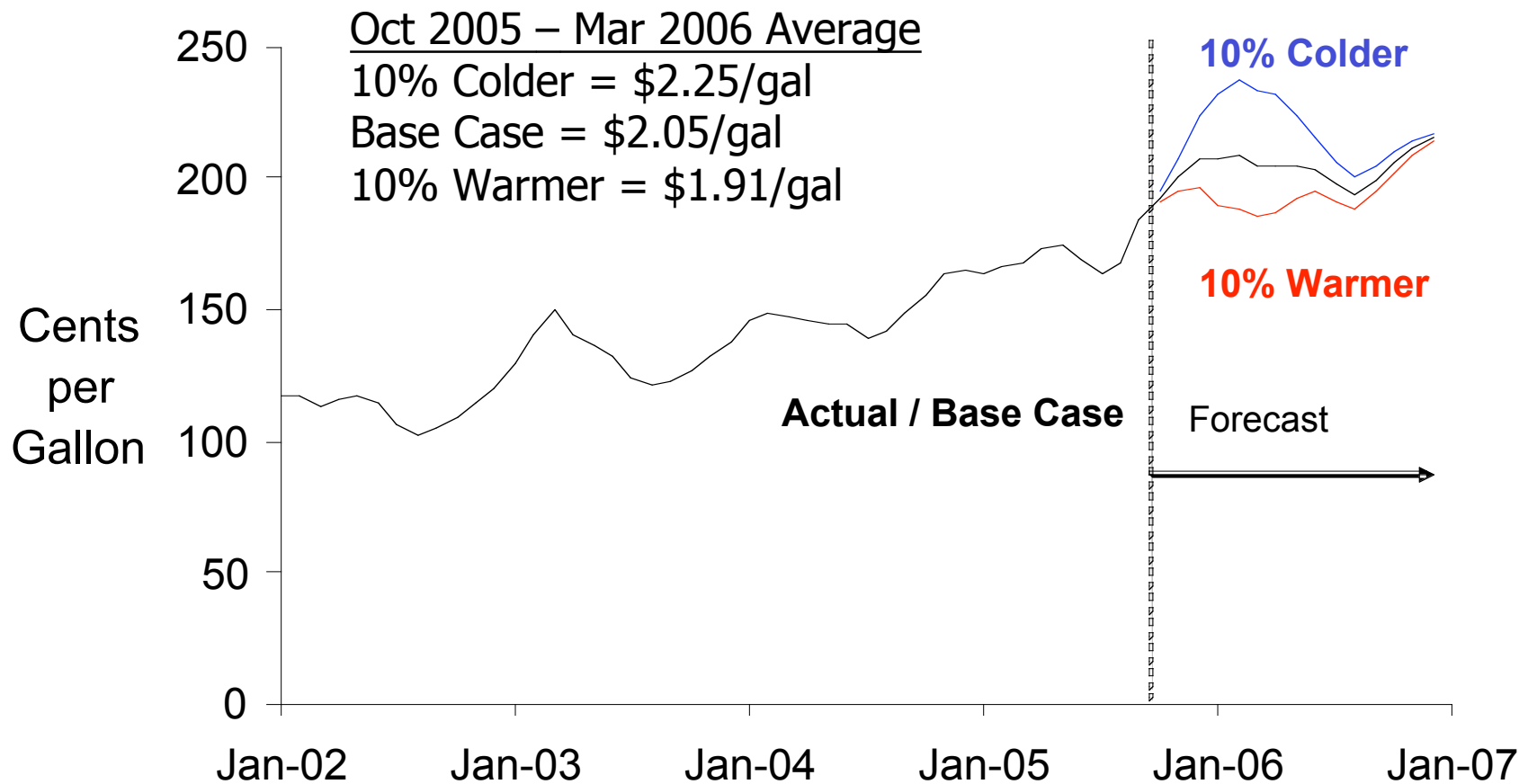
Retail Diesel Fuel Prices: Baseline, Warmer, Colder Cases



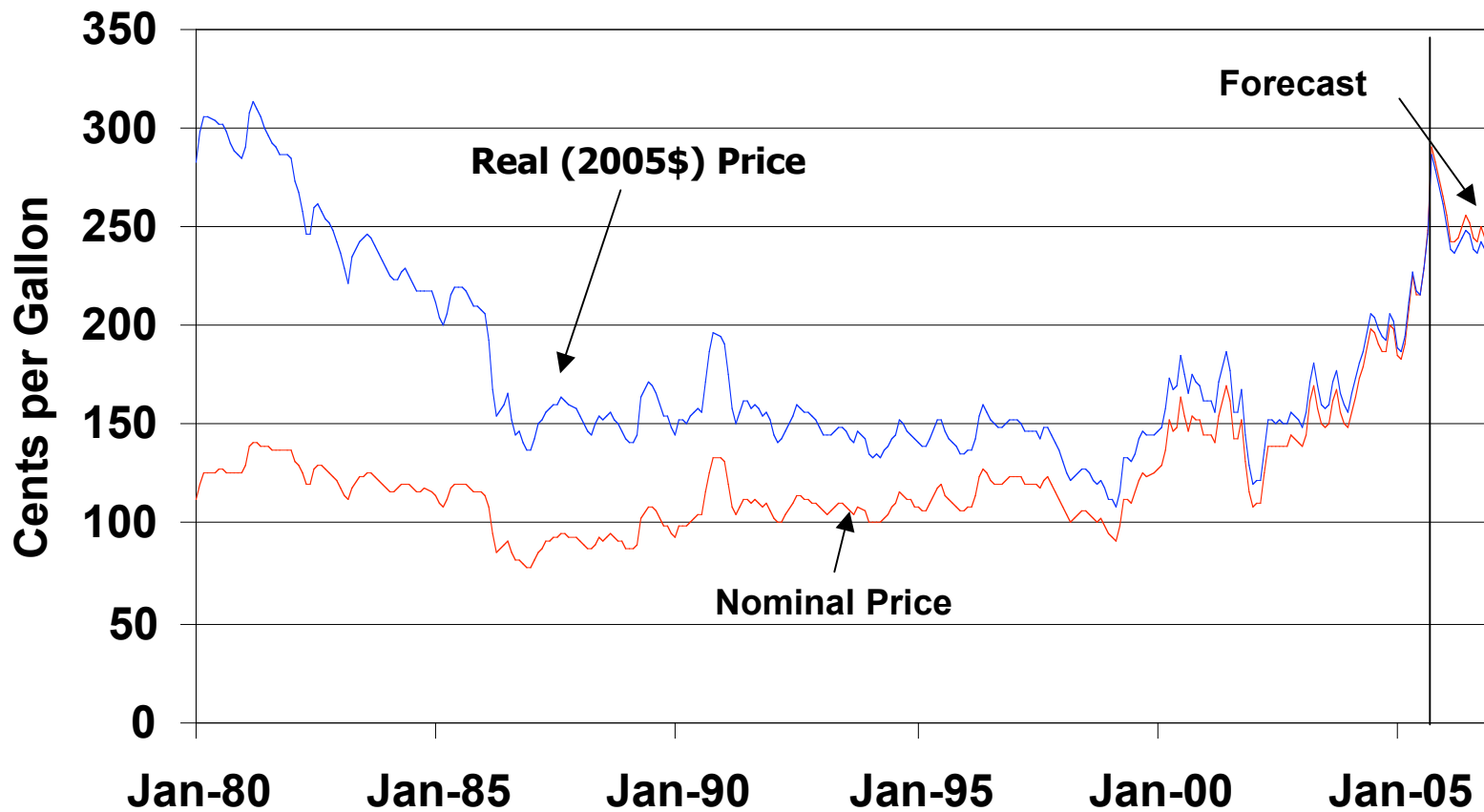
Propane Inventories: Baseline, Warmer, Colder Cases



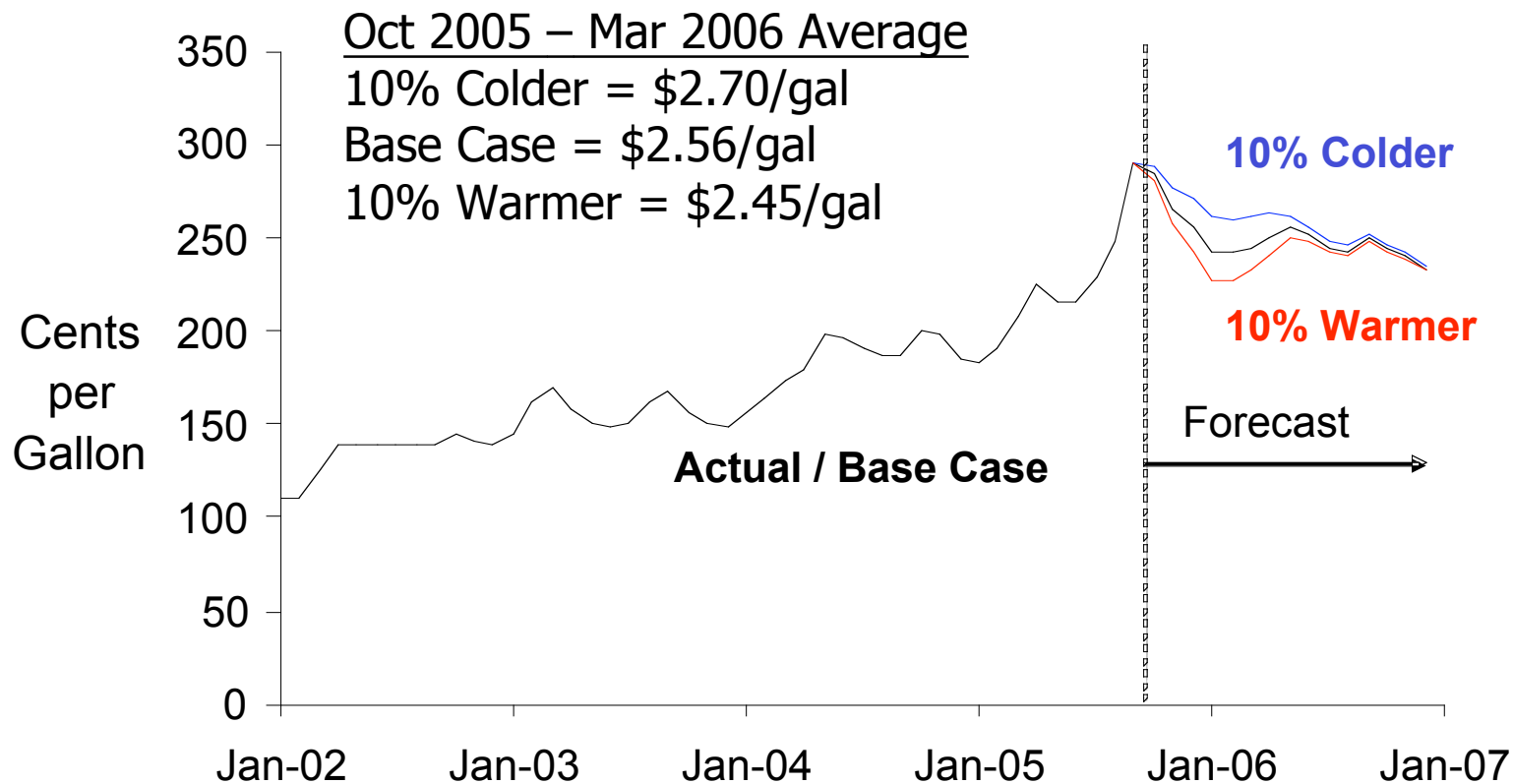
Propane Residential Prices: Baseline, Warmer, Colder Cases



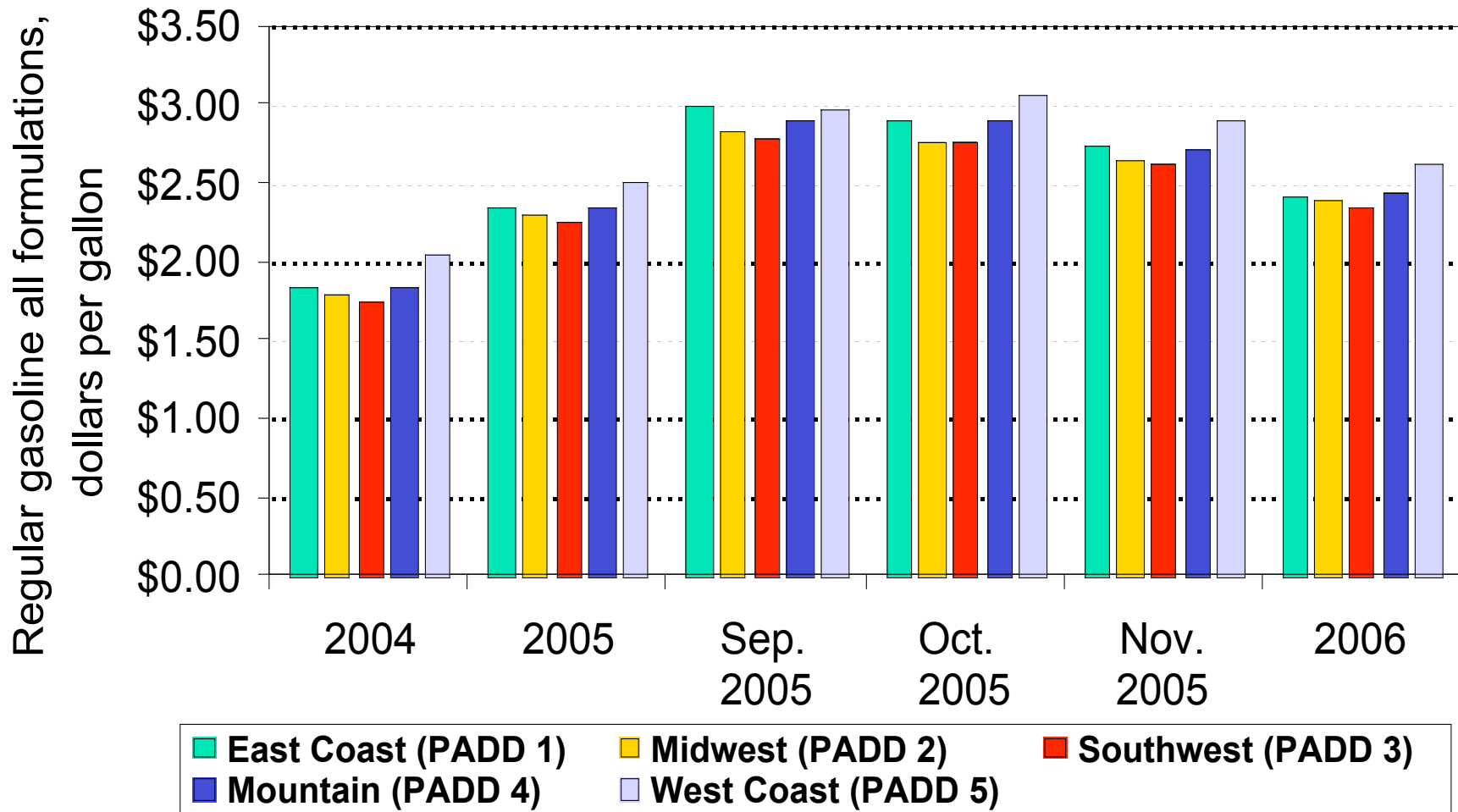
U.S. Gasoline Prices are Increasing in Real and Nominal Terms



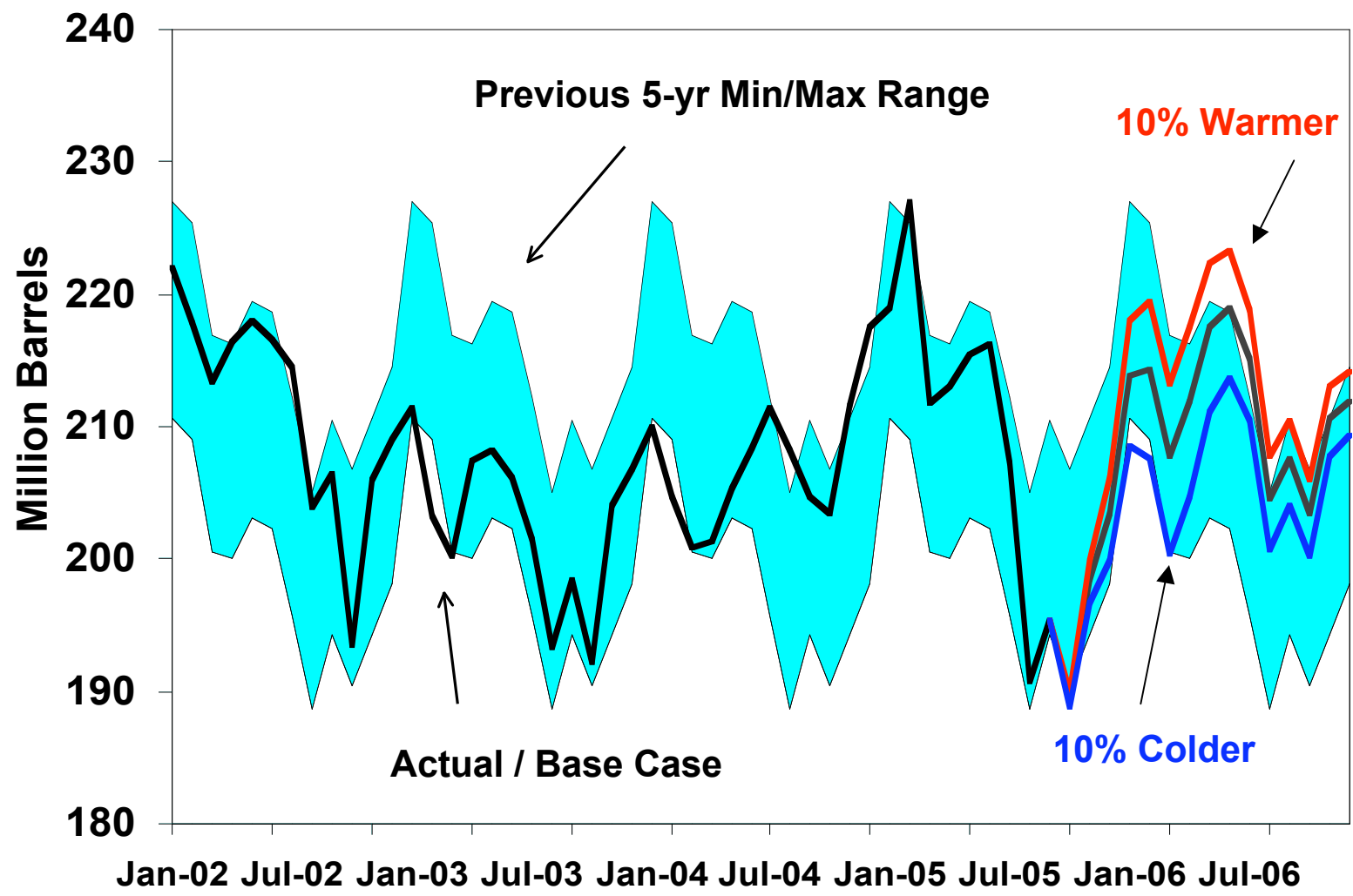
Retail Gasoline Prices: Baseline, Warmer, Colder Cases



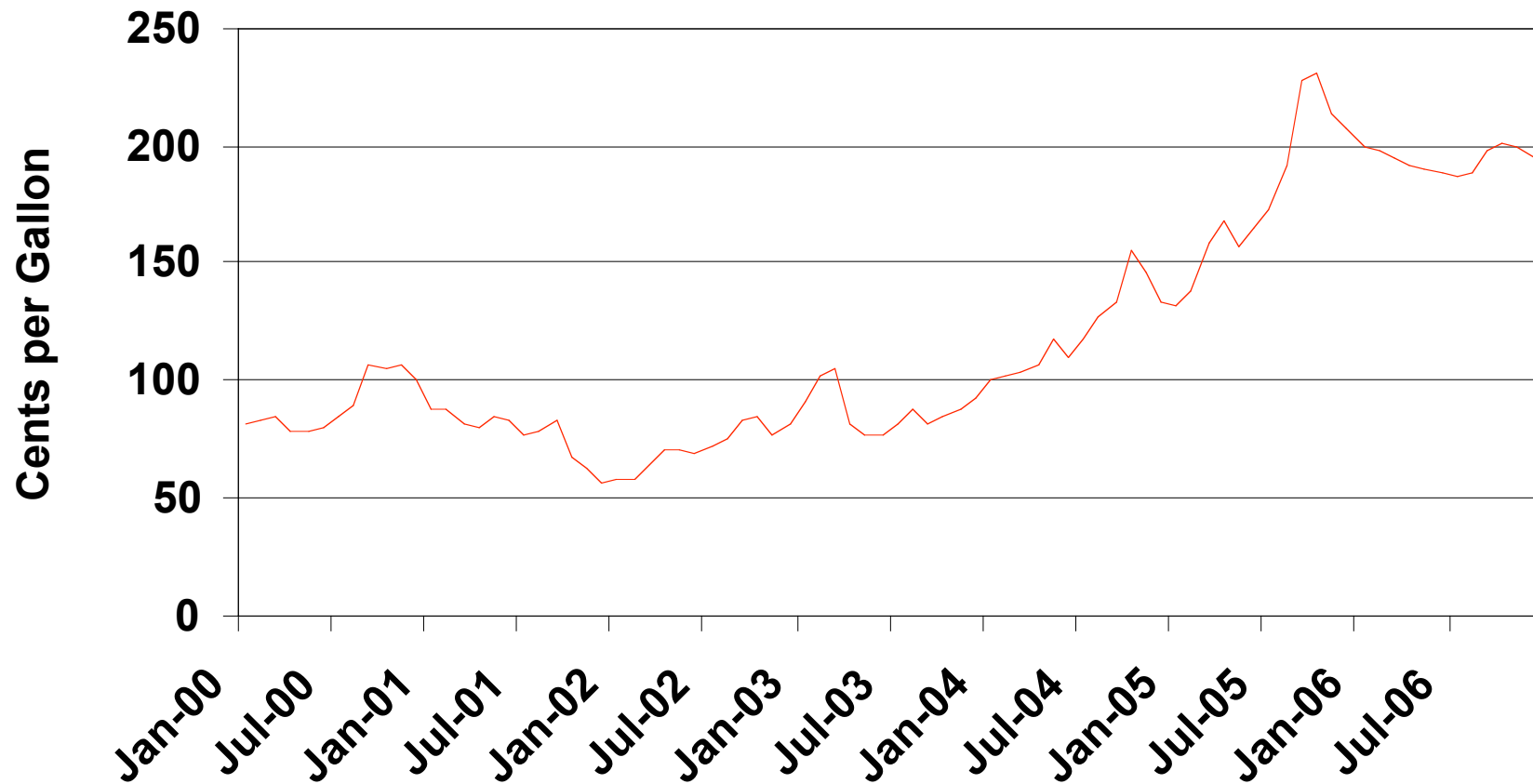
Gasoline Prices Vary Across Regions and Remain Higher than 2004



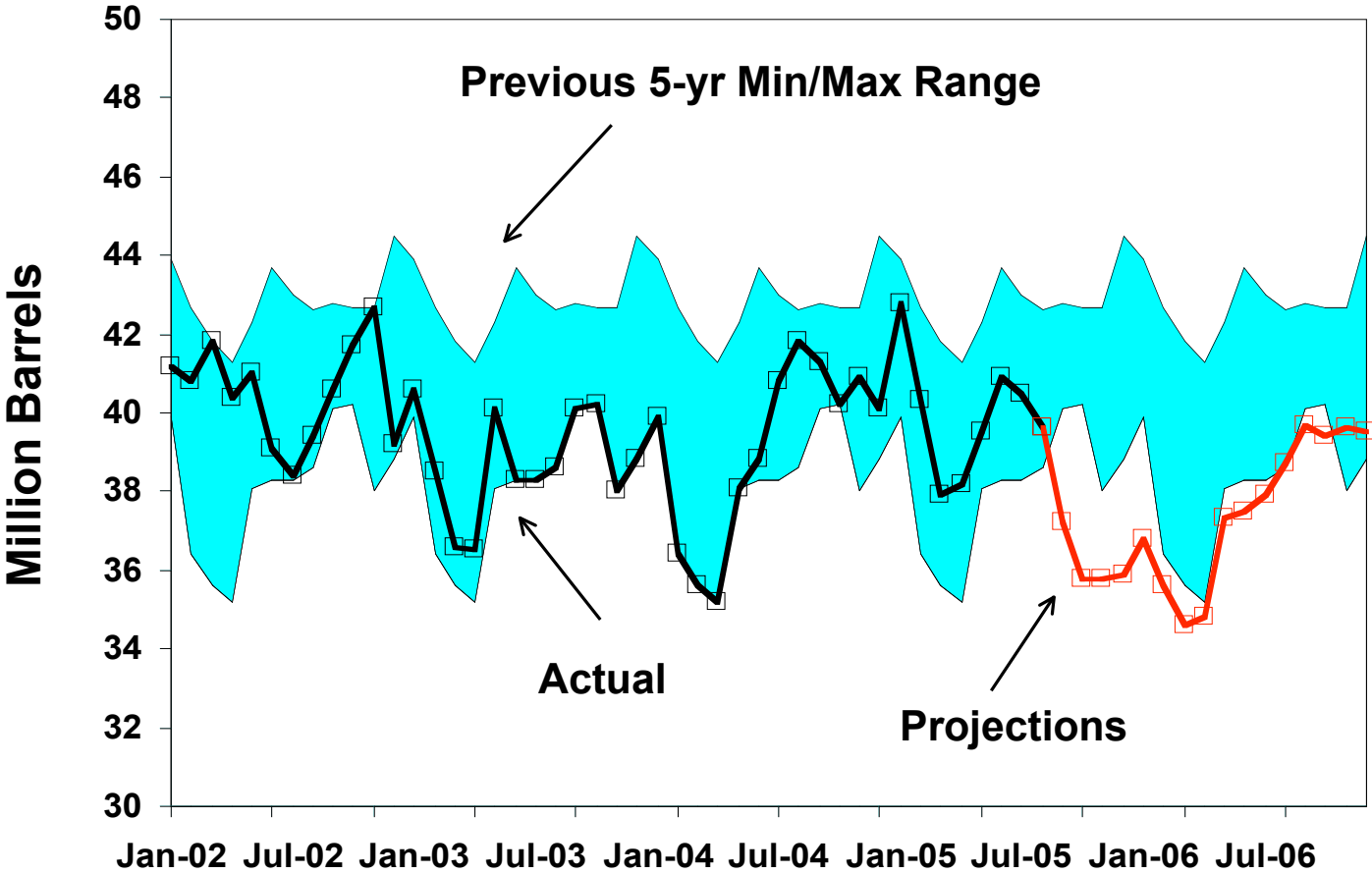
U.S. Total Gasoline Inventories



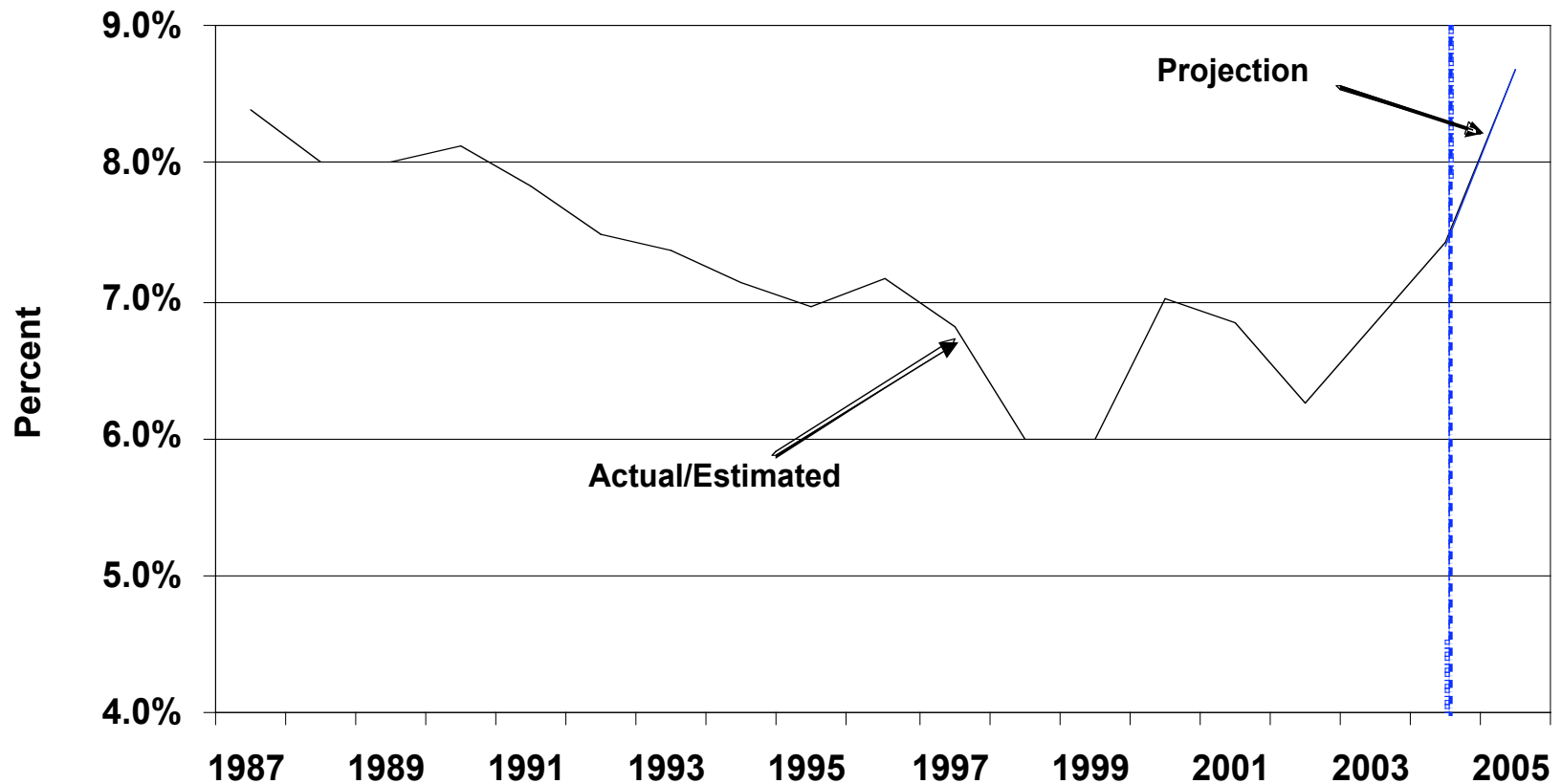
Jet Fuel Prices



Jet Fuel Stocks

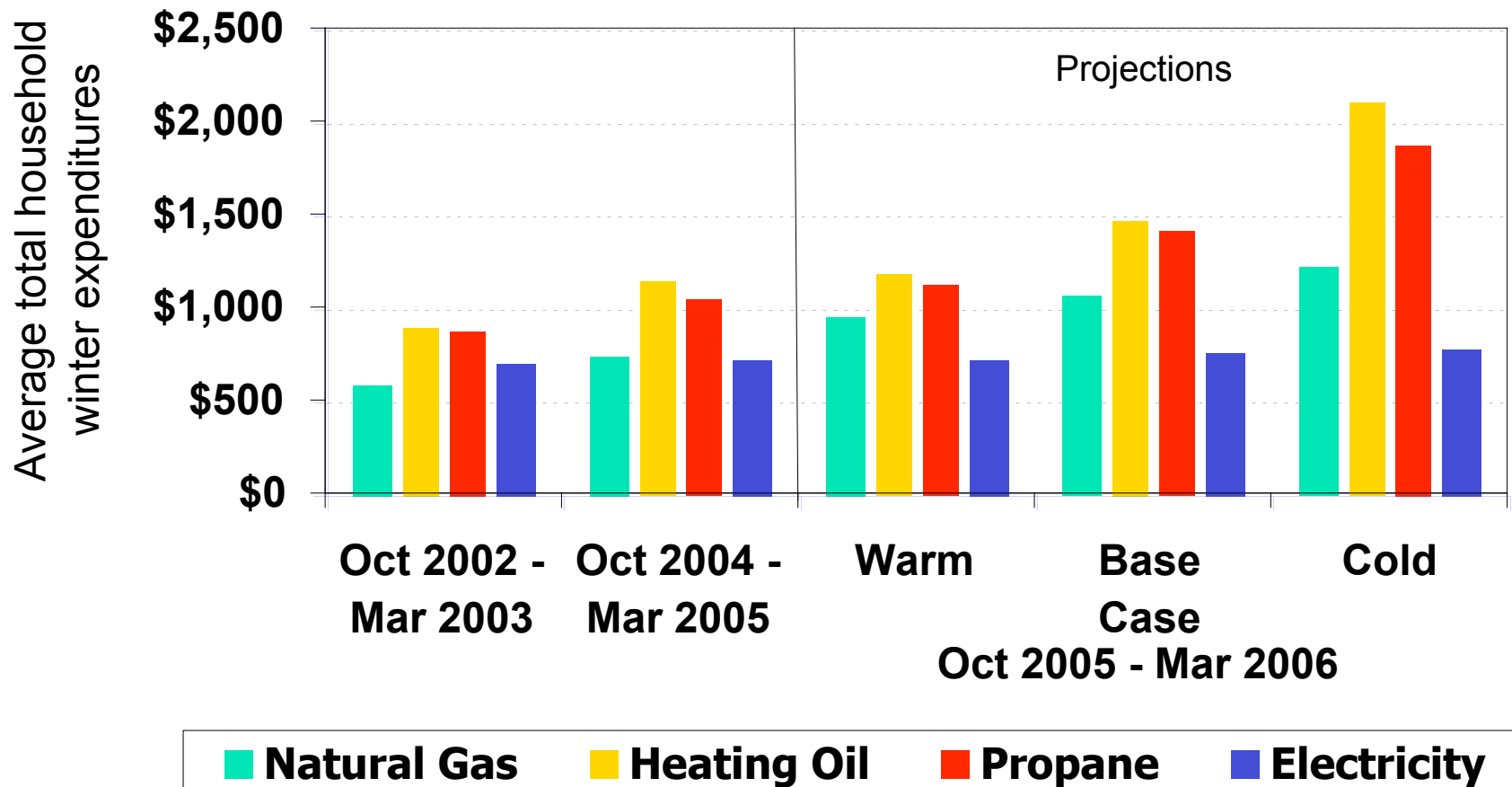


U.S Annual Energy Expenditures Now Account for About \$1 Trillion and 8.7% of GDP*

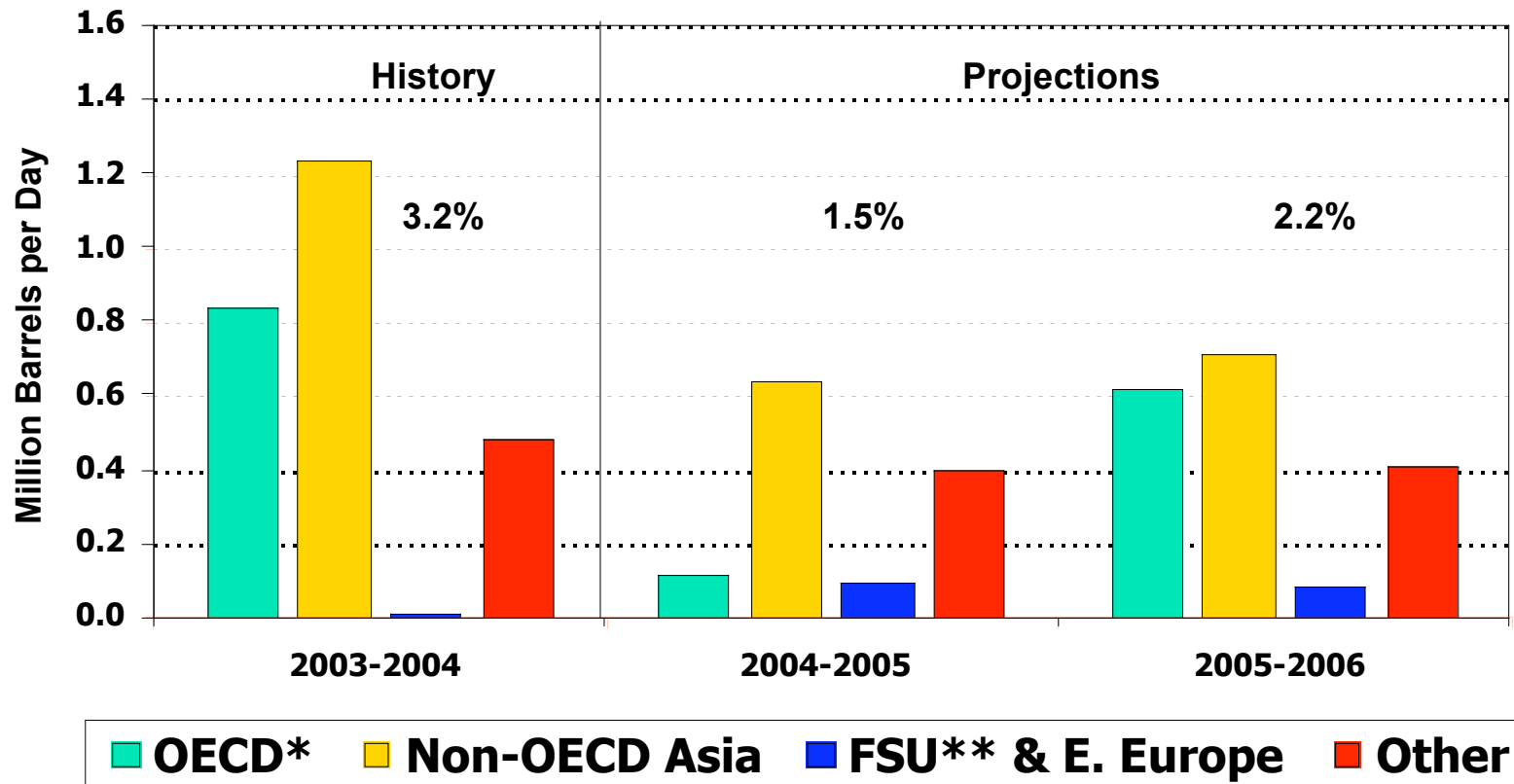


* Gross Domestic Product

Total U.S. Per Household Heating Fuels Expenditures are Expected to Rise



World Oil Demand Growth (Change from Previous Year)



* Countries belonging to Organization of Economic Cooperation and Development

** Former Soviet Union