

## Summer 2005 Motor Gasoline Outlook

### Summary

- ***Petroleum markets are tight*** and are likely to remain so through the summer season (April through September). High crude oil costs, refinery capacity constraints, strong gasoline demand growth, uncertainty about the availability of gasoline imports, high transportation costs, and additional changes in gasoline specifications have added to current and expected refinery operating costs and pump prices.
- ***Gasoline prices are projected to remain high.*** Summer season average retail prices (regular grade, all formulations) are projected to average \$2.28 per gallon, 38 cents above last summer. Monthly average prices are projected to peak about \$2.35 per gallon in May. On the West Coast, prices are expected to be substantially higher. In today's dollars, gasoline prices peaked in March 1981 at \$3.12 per gallon.
- ***Motor gasoline demand is projected to grow by 1.8 percent***, averaging 9.33 million barrels per day for the summer. Despite high prices, demand is expected to continue to rise due to increases in the driving-age population and per-capita vehicle miles traveled.
- ***Domestic motor gasoline output*** is projected to grow this summer. However, refinery output increases are not expected to keep up with demand growth due to limited growth in refining capacity. Resultant increases in utilization rates to new highs and the continuing implementation of new sulfur mandates are expected to add to operating costs for U.S. refiners.
- ***Increases in motor gasoline imports and larger primary gasoline inventories*** are expected to reduce the impacts of refinery capacity limitations, easing tightness in supply/demand balances and thereby mitigating price fluctuations. Inventories are starting the season at higher levels than those of a year ago. However, days' supply (beginning inventories divided by demand per day) has generally not risen significantly since 2003 and is projected to stay below historical averages through 2006.

**Table MG1. U.S. Motor Gasoline Summer Outlook Path**

	2004			2005			Change (%)		
	Q2	Q3	Season	Q2	Q3	Season	Q2	Q3	Season
<b>Prices (cents per gallon)</b>									
WTI Crude Oil (Spot) <sup>a</sup> .....	<b>91.3</b>	<b>104.5</b>	<b>97.9</b>	<i>135.4</i>	<i>134.3</i>	<i>134.8</i>	48.2	28.6	37.7
Imported Crude Oil Price <sup>b</sup> .....	<b>80.9</b>	<b>92.0</b>	<b>86.4</b>	<i>116.5</i>	<i>116.2</i>	<i>116.4</i>	44.1	26.3	34.6
Wholesale Gasoline Price <sup>c</sup> .....	<b>134.2</b>	<b>132.6</b>	<b>133.4</b>	<i>167.9</i>	<i>159.5</i>	<i>163.7</i>	25.1	20.2	22.7
Retail Gasoline Price <sup>d</sup> .....	<b>191.8</b>	<b>188.7</b>	<b>190.2</b>	<i>232.5</i>	<i>224.5</i>	<i>228.5</i>	21.2	19.0	20.1
<b>Stocks, Incl. Blending Components</b> (million barrels)									
Beginning .....	<b>201</b>	<b>209</b>		<i>212</i>	<i>212</i>				
Ending .....	<b>209</b>	<b>206</b>		<i>212</i>	<i>202</i>				
<b>Demand/Supply</b> (million barrels per day)									
Total Demand.....	<b>9.161</b>	<b>9.174</b>	<b>9.167</b>	<i>9.321</i>	<i>9.341</i>	<i>9.331</i>	1.8	1.8	1.8
Total Output <sup>e</sup> .....	<b>8.370</b>	<b>8.316</b>	<b>8.343</b>	<i>8.404</i>	<i>8.361</i>	<i>8.382</i>	0.4	0.5	0.5
Total Stock Withdrawal (Incl. Blend. Components) .....	<b>-0.082</b>	<b>0.025</b>	<b>-0.028</b>	<i>0.001</i>	<i>0.111</i>	<i>0.056</i>			
Net Imports (Incl. Blend. Components) .....	<b>0.874</b>	<b>0.832</b>	<b>0.853</b>	<i>0.916</i>	<i>0.869</i>	<i>0.893</i>	4.9	4.4	4.7
Refinery Utilization (percent).....	<b>94.6</b>	<b>94.7</b>	<b>94.7</b>	<i>96.1</i>	<i>94.7</i>	<i>95.4</i>			
<b>Market Indicators</b>									
Real GDP (billion 2000 dollars).....	<b>10785</b>	<b>10891</b>	<b>10838</b>	<i>11206</i>	<i>11288</i>	<i>11247</i>	3.9	3.6	3.8
Real Income (bill. 2000 dollars).....	<b>7952</b>	<b>8010</b>	<b>7981</b>	<i>8219</i>	<i>8264</i>	<i>8242</i>	3.4	3.2	3.3
Industrial Output (index, 1997=100)....	<b>115.1</b>	<b>115.9</b>	<b>115.5</b>	<i>119.5</i>	<i>120.2</i>	<i>119.9</i>	3.8	3.8	3.8
Miles Traveled (mill. miles per day)....	<b>8278</b>	<b>8258</b>	<b>8268</b>	<i>8387</i>	<i>8378</i>	<i>8382</i>	1.3	1.5	1.4
Average MPG (miles per gallon).....	<b>21.5</b>	<b>21.4</b>	<b>21.5</b>	<i>21.4</i>	<i>21.4</i>	<i>21.4</i>	-0.4	-0.4	-0.4

<sup>a</sup>Spot price of West Texas Intermediate (WTI) crude oil.

<sup>b</sup>Cost of imported crude oil to U.S. refiners.

<sup>c</sup>Price of gasoline sold by refiners to resellers.

<sup>d</sup>Average pump price for regular gasoline, all formulations, including taxes.

<sup>e</sup>Refinery output plus motor gasoline field production, *including* fuel ethanol blended into gasoline and new supply of oxygenates and other hydrocarbons for gasoline production but *excluding* volumes related to net imports of or inventory changes in motor gasoline blending components.

GDP = gross domestic product.

Notes: Minor discrepancies with other Energy Information Administration (EIA) published historical data are due to rounding. Historical data are printed in bold. Forecasts are in italic. The forecasts were generated by simulation of the Short-Term Integrated Forecasting System. Sources: Historical data: latest data available from: EIA, *Petroleum Supply Monthly*, DOE/EIA-0109 ([http://www.eia.doe.gov/oil\\_gas/petroleum/data\\_publications/petroleum\\_supply\\_monthly/psm.html](http://www.eia.doe.gov/oil_gas/petroleum/data_publications/petroleum_supply_monthly/psm.html)); *Monthly Energy Review*, DOE/EIA-0035 (<http://www.eia.doe.gov/emeu/mer/contents.html>); U.S. Department of Commerce, Bureau of Economic Analysis; Federal Reserve System; National Oceanic and Atmospheric Administration. Macroeconomic projections are based on Global Insight Forecast CONTROL0305.

For updates to the monthly forecast, see <http://www.eia.doe.gov/steo>. For updates to this table, see <http://www.eia.doe.gov/emeu/steo/pub/tabmg1.html>. For the most recent petroleum data, see the Weekly Petroleum Status Report at [http://www.eia.doe.gov/oil\\_gas/petroleum/data\\_publications/weekly\\_petroleum\\_status\\_report/wpsr.html](http://www.eia.doe.gov/oil_gas/petroleum/data_publications/weekly_petroleum_status_report/wpsr.html).

## Analysis

### Crude Oil and Motor Gasoline Prices

Crude oil prices, as represented by the West Texas Intermediate (WTI) benchmark, surpassed \$57 per barrel in early April. WTI prices are projected to average \$56.62 per barrel (135 cents per gallon) for the summer, up from \$41.12 per barrel last summer.

Several factors have contributed to the recent high U.S. dollar crude oil prices and are likely to keep projected prices near current levels.

- *Growth in world oil demand is projected to remain robust, despite high oil prices.* Worldwide demand, which grew an estimated 2.7 million barrels per day, or 3.3 percent, in 2004, is projected to climb a further 2.2 million barrels per day, or 2.7 percent, in 2005. Chinese demand growth, which increased 1 million barrels per day last year, is projected to moderate to an average of 650,000 thousand barrels per day over the next 2 years. U.S. demand, having increased almost 500,000 barrels per day last year, is projected to increase an additional 340,000 barrels per day, or 1.7 percent, in the current year.
- *Non-Organization of Petroleum Exporting Countries (OPEC) crude oil supply has been flat since the fourth quarter of 2003, increasing the dependence on OPEC sources to accommodate growth in worldwide demand.* In 2005, non-OPEC total liquids production is projected to grow by about 0.5 million barrels per day.
- *Worldwide spare crude oil production capacity has diminished.* During the 1990s, that capacity averaged an estimated 3 million barrels per day. It reached a peak of 5.7 million barrels per day in 2002 before declining sharply in 2004 to 1.1 million barrels per day. In 2005, however, spare production capacity is projected to increase to 1.3 million barrels per day, similar to the increase in worldwide demand. However, spare production capacity is expected to drop to half that level in 2006 as world demand continues to grow by another 2.1 million barrels per day.
- *Freight rates are projected to remain high in historical terms but decline from their 2004 levels.* An increase in available tonnage is expected to absorb growth in loadings.
- *Geo-political risks, a significant feature of crude oil price behavior for more than 2 years, are expected to keep the uncertainty premium high.* Major sources of uncertainty are: the continued insurgency in Iraq, which has affected both output and exports in the past; and political unrest in Venezuela and Nigeria.

Retail motor gasoline prices during the summer are expected to average \$2.28 per gallon, up 38 cents from last summer's average, and a new high in nominal U.S. dollar terms (Figure MG1). Monthly average prices are projected to reach a peak of \$2.35 per gallon in May. Several factors, which are listed below, have contributed to recent high gasoline prices and are also expected to keep prices high for several months.

- *Most crude oil price changes are passed through to retail gasoline prices.* The very high crude oil prices of the past few days and the prospect of even higher crude oil prices in April are projected to result in a new high for motor gasoline prices in May, as mentioned above.
- *U.S. refineries are expected to produce increased amounts of motor gasoline by operating at increased utilization rates and yields in response to high demand.* This is likely to raise operating costs and, hence, wholesale and retail motor gasoline prices (see below).
- *The continued phase-in of low-sulfur Tier 2 gasoline regulations is likely to raise refinery production costs (see below).*

It should be noted that, despite recent run-ups, U.S. average regular retail motor gasoline prices peaked at \$3.12 per gallon in today's dollars in March 1981.

***Regional Motor Gasoline Prices.*** Gasoline prices vary by region (Figure MG2). On the West Coast, retail prices have been substantially higher than the national average and are likely to remain so. In the last 5 years, maximum weekly price deviations among regions have averaged 26 cents per gallon but have been as high as 50 cents. Reasons for variations include: differences in transportation (barge and pipeline) costs, differences in regional environmental mandates, and differences in state sales and excise taxes, which have been as high as 22 cents per gallon.

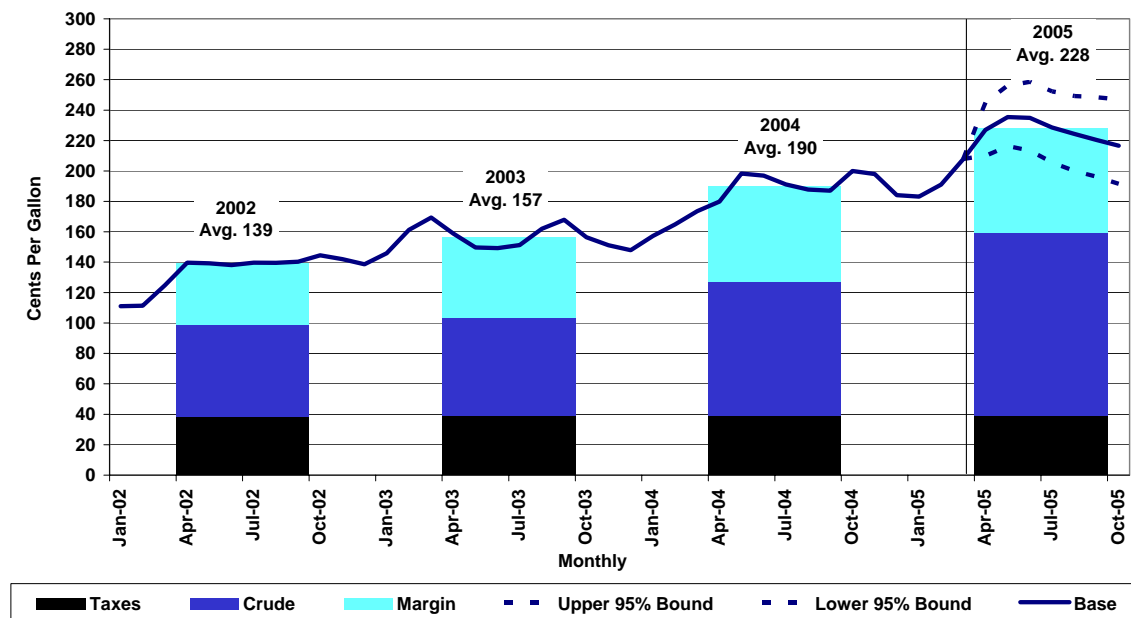
***Margins.*** Based on EIA's weekly gasoline price survey, the U.S. average regular gasoline price (all formulations) averaged \$2.08 per gallon in March, up 34 cents from last year. The average WTI crude oil price rose about 42 cents from March 2004 to March 2005. Thus, total margins (the difference between pump prices and crude oil costs) this March were somewhat below the year-ago level. Total average margins for the summer, however, are expected to be higher than those of the summer of 2004. Higher margins are expected to result from higher refinery utilization rates brought about by the combined effects of high demand and limited increases in refinery capacity. Figure MG3 summarizes average inflation-adjusted summer-season actual and projected margins since 1999.

***Fuel Specifications.*** As in the past, the United States will continue to implement fuel specification changes designed to produce cleaner-burning fuels. As part of this effort, the implementation of the low-sulfur gasoline program, initiated in 2004, is scheduled to be completed in 2006. The Tier 2 Motor Vehicle Emissions Standards and Gasoline Sulfur Control Requirements, mandated by the Environmental

Protection Agency (EPA), are designed to limit emissions from new passenger cars and light trucks. The regulations set more stringent emission standards on vehicles and reduce the sulfur content in gasoline. Sulfur in gasoline contributes to the formation of undesirable emissions such as nitrogen oxides (NO<sub>x</sub>) and inhibits the performance of advanced car and light-truck catalytic exhaust emission controls needed to achieve Tier 2 requirements. For more details, see the web page on [Tier 2 Vehicle and Gasoline Sulfur Program](#).

Both low-sulfur gasoline and ultra-low-sulfur diesel fuel cost more to produce than the higher-sulfur fuels. The National Petroleum Council has estimated that the implementation of the Tier 2 regulations could add as much as 5 cents per gallon to refinery production costs. That estimate assumes no unanticipated difficulties such as those previously faced by refiners in adapting to new regulations, which caused temporary, but significant, increases in motor gasoline prices.

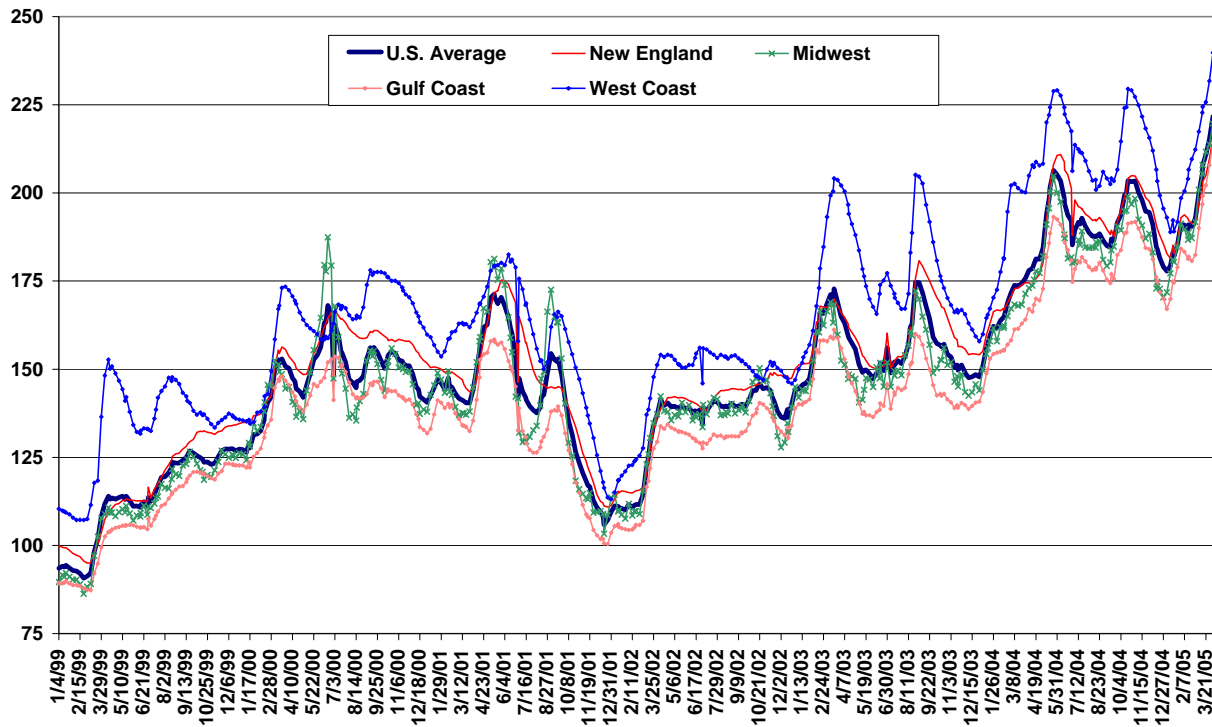
**Figure MG1. Summer Retail Motor Gasoline Price\* Cases**  
(Base Case and 95% Confidence Range\*\*)



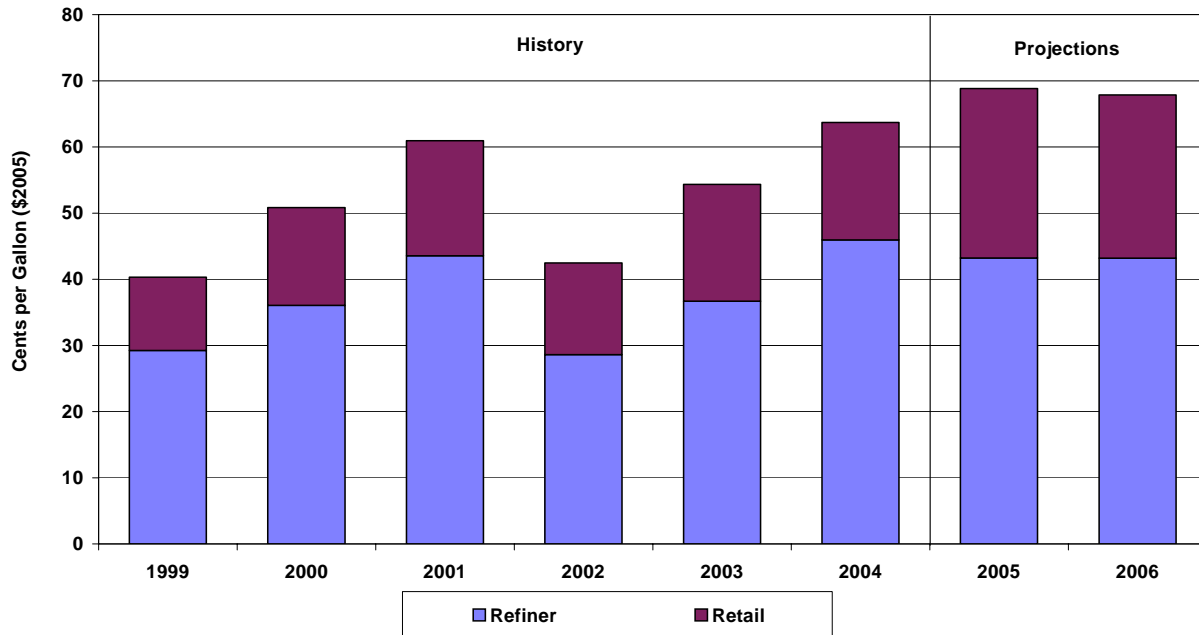
\*Regular gasoline retail price (including taxes), all formulations.

\*\*The confidence range is based on the properties of the Short-term Model and excludes explicit consideration of major supply disruptions. The 95-percent confidence range in MG1 reflects the estimated uncertainty based on the structure of the Energy Information Administration's (EIA) short-term model. The confidence interval does not include estimates of the impact of particular major crude oil or gasoline market supply disruptions.

**Figure MG2. Weekly Regular Motor Gasoline Prices -- Cents per Gallon**



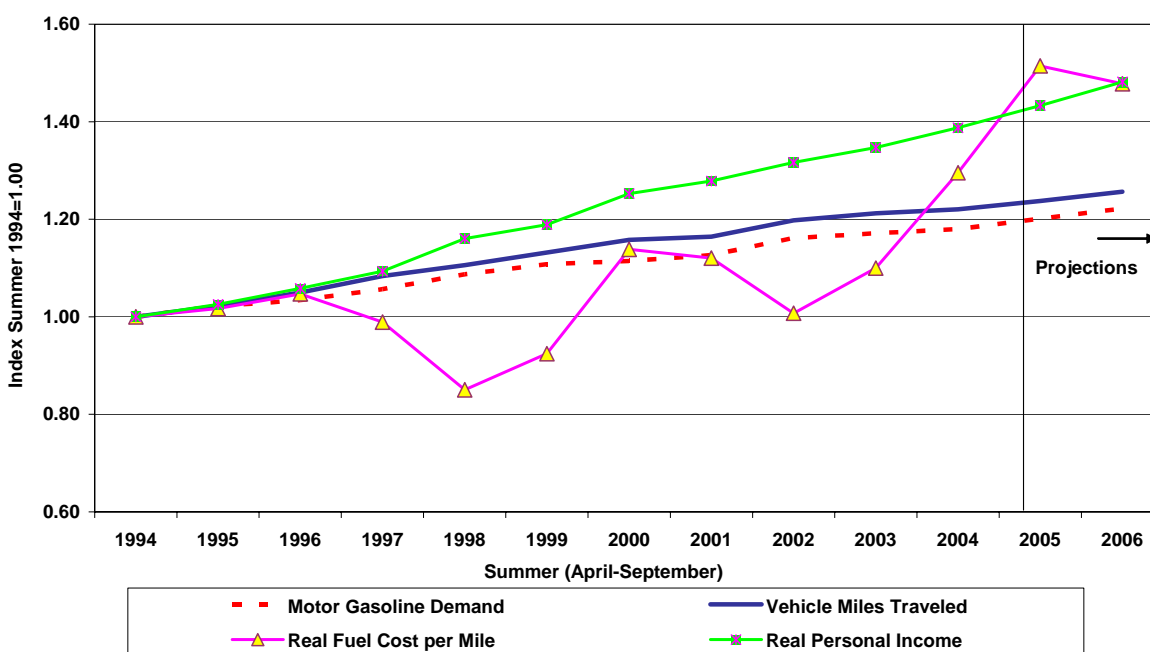
**Figure MG3. Inflation-Adjusted Summer Motor Gasoline Margins**



## Demand

Figure MG4 summarizes both historical and projected trends in motor gasoline demand and related gasoline market indicators. Motor gasoline growth patterns reflect growth in the number of drivers and per-capita highway travel, and stable or declining fleet-wide fuel efficiencies. This summer, total domestic gasoline demand is expected to average 9.33 million barrels per day. The demand growth relative to last summer, 1.8 percent, is above the average growth of the previous 5 years despite high prices. Part of the projected growth for this summer, however, stems from unusual demand weakness during the third quarter of 2004, during which consumers were reacting to that summer's run-up in retail pump prices.

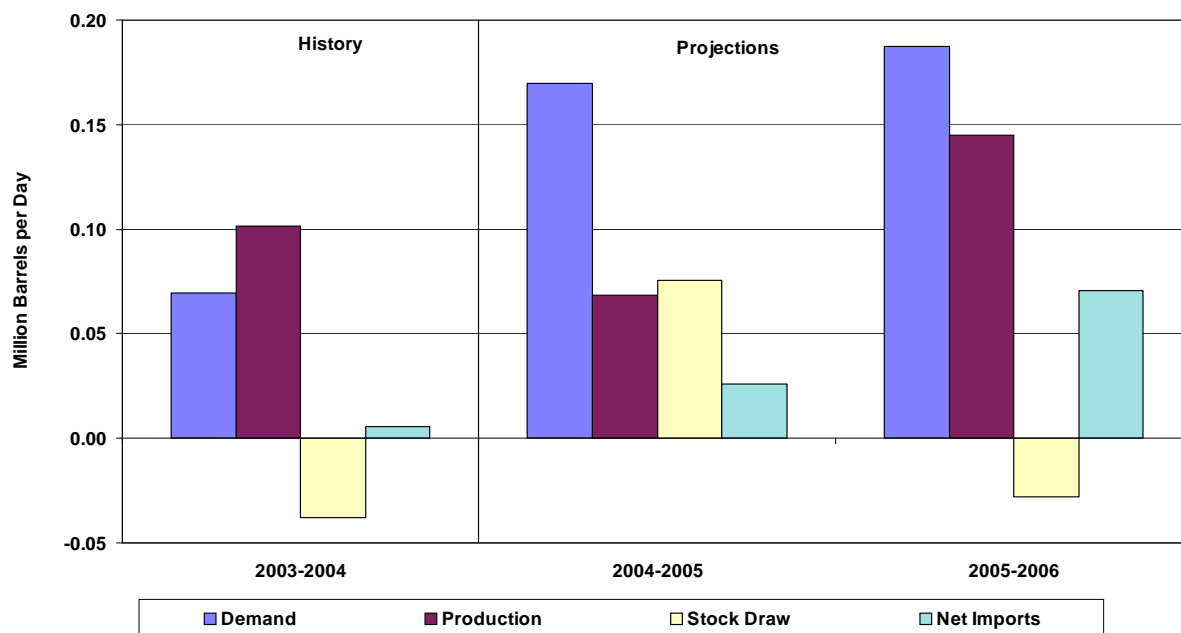
**Figure MG4. Summer Motor Gasoline Market Indicators**



## Supply

Figure MG5 illustrates projected demand and supply patterns compared to recent historical periods. Motor gasoline demand, including blending components, is supplied by three sources: primary gasoline inventories, domestic refinery output and field production, and net imports. The experiences of recent summer seasons have heightened concerns about the ability of these sources (and related distribution systems) to meet the anticipated high demand. Contributing to these concerns are the Tier 2 sulfur requirements and the potential for unscheduled refinery and pipeline outages.

**Figure MG5. Summer Motor Gasoline Supply and Demand**  
(change from prior year)



Note: Net imports and stock draw include blending components.

## Inventories

Figure MG6 depicts recent and projected stock levels. Total primary motor gasoline stocks are currently at comparatively high levels. Stocks are estimated to be 212 million barrels at the beginning of the summer, 11 million barrels above last year's level and 10 million barrels above the average end-of-March stock levels of the last 5 years. End-of-season inventories are projected to be 202 million barrels, 5 million barrels below last year but little different from the previous 5-year average. In contrast to last summer, during which inventories actually rose, primary stocks are projected to decline in a manner consistent with normal seasonal patterns. As a result, inventories are expected to play a more prominent role in meeting projected demand, thereby helping to mitigate price fluctuations.

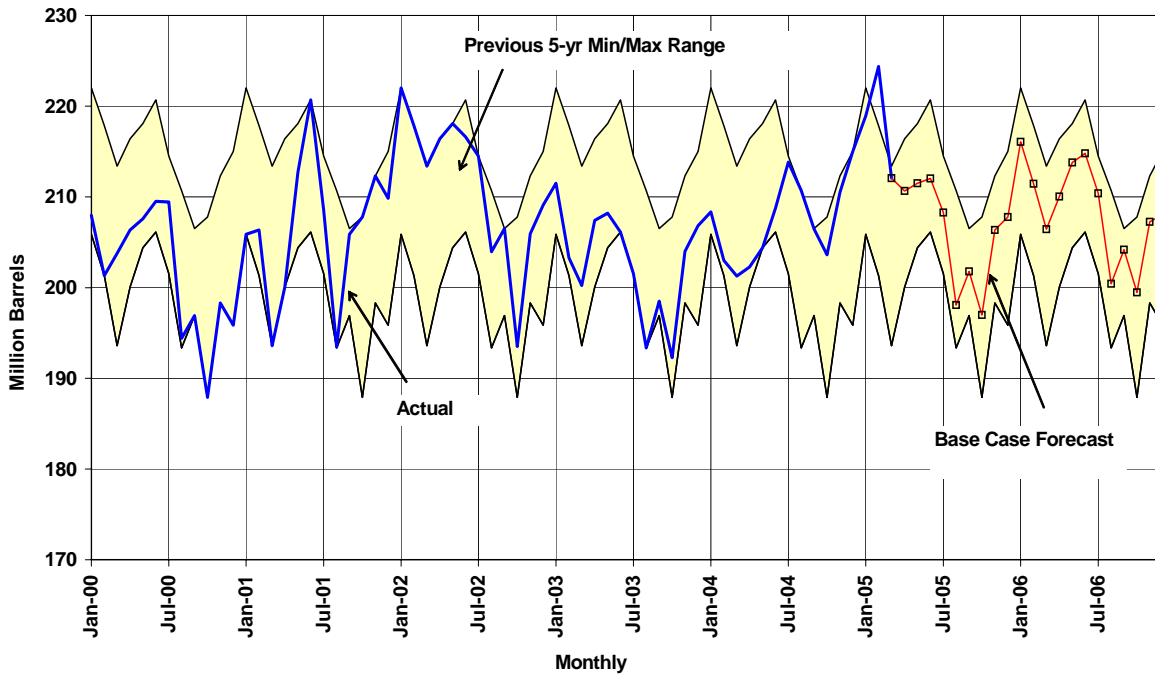
On a regional basis, stock levels have also generally improved. Beginning-of-season East Coast, Gulf Coast, and Midwest inventories are substantially above recent historical averages. West Coast stocks are at about the same level as those in previous seasons. However, the geographical isolation and oxygenate requirements are expected to constrain both pipeline and imported supplies in the West Coast region, partly accounting for the high retail prices and price volatility compared to the rest of the country.

Figure MG7 summarizes inventory levels in terms of forward days' supply for the summer season. Although inventories seem high in absolute terms, in days' supply

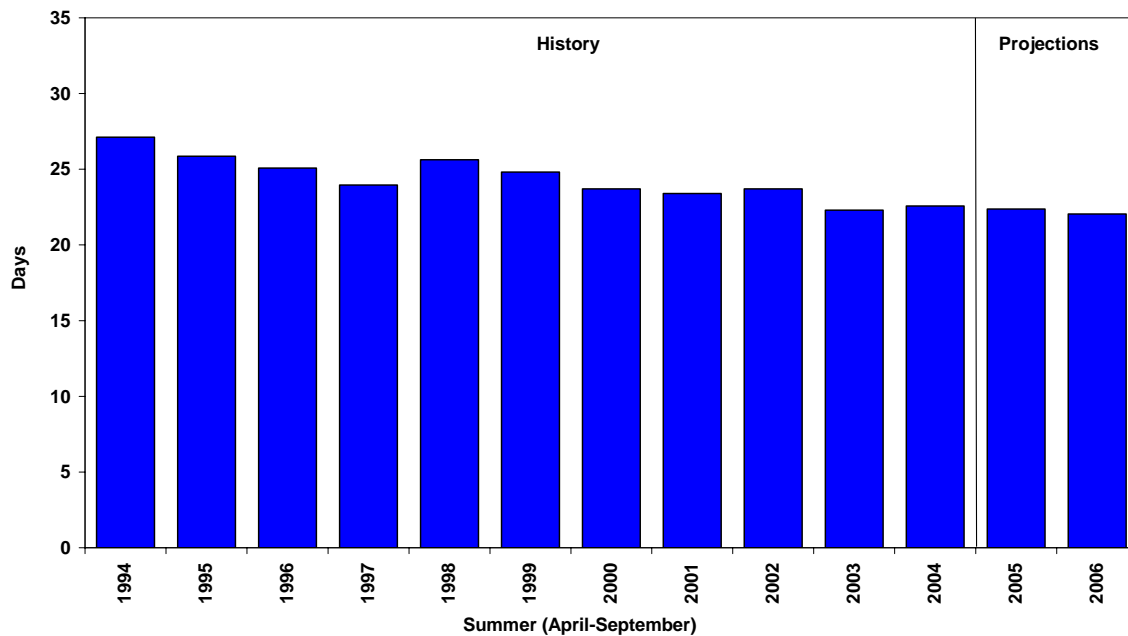


terms inventories remain close to the low seen in 2003. Due to the projected demand increase for this summer, they are not projected to exhibit any change.

**Figure MG6. Motor Gasoline Stocks**



**Figure MG7. Days' Supply of Gasoline – Summer Season Average**

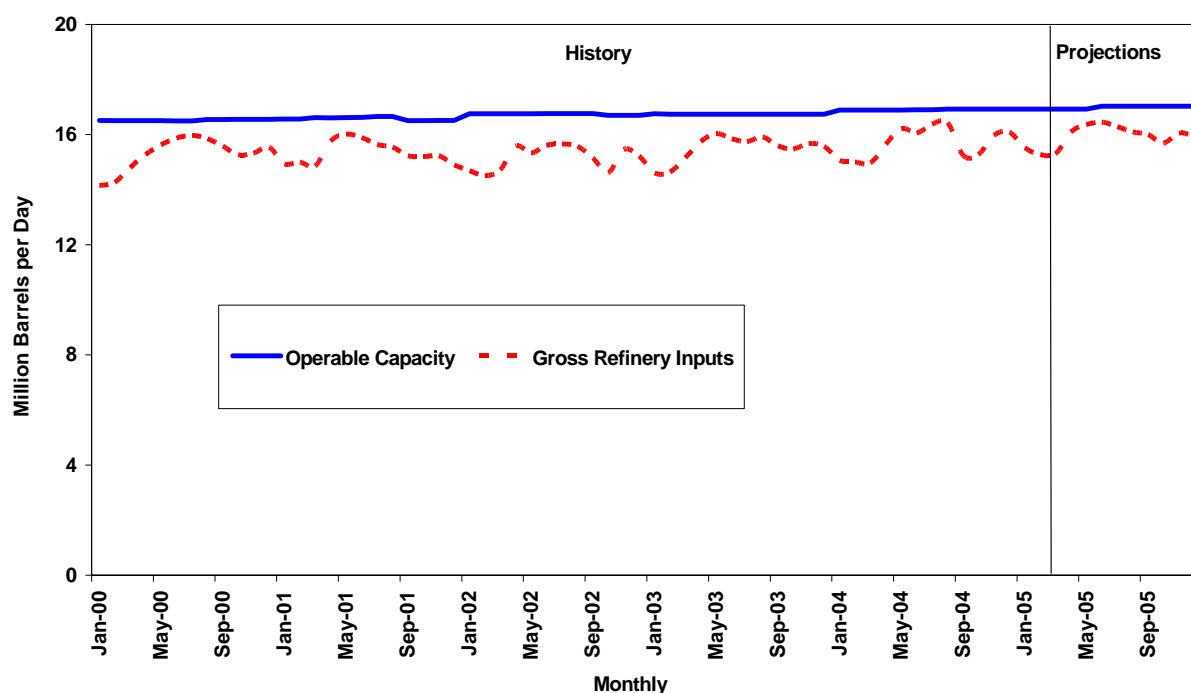


## Domestic Output

The need for increased refinery supplies of gasoline is expected to result in increased refinery marginal costs resulting from higher utilization rates and yields. Domestic output of motor gasoline is expected to average 8.38 million barrels per day, up about 40,000 barrels per day (0.5 percent) from last summer.

Figure MG8 shows refinery throughput and capacity. Refinery utilization is expected to average 95.4 percent, up from the 94.7 percent seen last summer. Motor gasoline yields are projected to average 45.8 percent, slightly below the 46.0 percent recorded last summer. In the short term, utilization rates and yields have been even higher, indicating that refineries are able to produce even more motor gasoline to meet unanticipated spikes in demand. However, production costs are expected to remain high as near-term input supplies remain tight and blending-related costs continue to climb.

**Figure MG8. Refinery Capacity and Utilization**



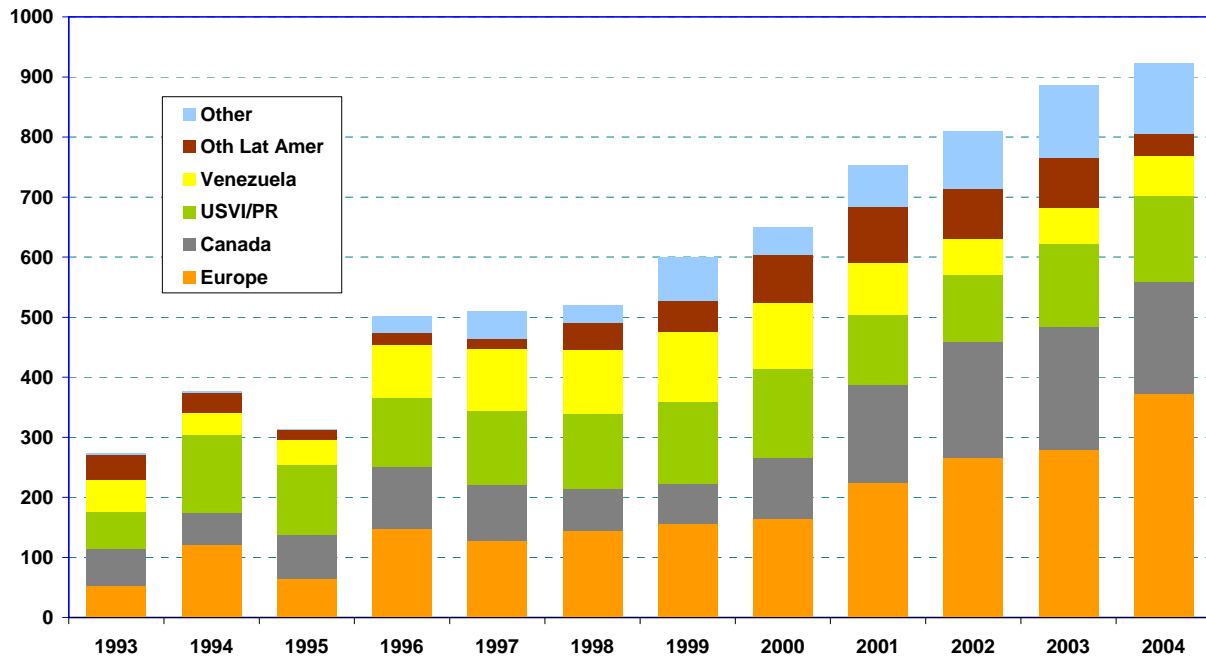
## Net Imports

Net imports of total motor gasoline (finished motor gasoline plus blending components) are projected to average 890,000 barrels per day this summer, up almost 5 percent from last summer's average, and a new high. Nonetheless, incremental foreign supplies may be harder to obtain than in previous summers and are expected to be costly. Figure MG9 summarizes imports of total motor gasoline since 1993.

The figure shows that Europe is the largest source of supply of total motor gasoline imports into the United States. That region also accounts for the bulk of incremental supplies, especially blending components. Imports of blending components have grown substantially since 1995, when the reformulated gasoline program was implemented, and have occasionally exceeded imports of finished motor gasoline.

The difference between U.S. and Western European prices often exceeds transportation costs, resulting in a westward flow of motor gasoline, as shown in Figure MG10. High transportation costs in recent periods have raised the bar on the size of transatlantic price differentials required to induce spot cargos to flow towards the U.S. East Coast. However, current price signals clearly favor marginal gasoline shipments to the U.S. East Coast from European sources or from other sources serving European and U.S. gasoline markets. Imports to the East Coast comprise about 25 percent of total motor gasoline requirements (compared to less than 2 percent for the rest of the United States) and account for 88 percent of total motor gasoline imports.

**Figure MG9. Total Motor Gasoline Imports by Source (MB/D)**



**Figure MG10. Conventional Gasoline Price Differentials Between New York and Europe and Freight Costs**

