STATEMENT OF

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BEFORE THE

SUBCOMMITTEE ON ENERGY AND WATER DEVELOPMENT

COMMITTEE ON APPROPRIATIONS

UNITED STATES SENATE

June 25, 2008

Mr. Chairman and Members of the Committee:

I appreciate the opportunity to appear before you today to discuss the factors the Energy Information Administration (EIA) considers when making our short-term forecasts of oil and gasoline prices.

EIA is the independent statistical and analytical agency within the Department of Energy. While we do not promote, formulate, or take positions on policy issues, we do produce objective, timely, and relevant data, projections, and analyses that are meant to assist policymakers, help markets function efficiently, and inform the public. Our views are strictly those of EIA and should not be construed as representing those of the Department of Energy or the Administration.

As requested in your invitation letter, my testimony focuses on recent forecasts for oil and gasoline prices and the factors that are considered in making these forecasts. It also touches briefly on our forecasting record and elements in our Fiscal Year 2009 budget request that will contribute to better forecasting and analyses.

To briefly summarize the main points addressed in this testimony:

- Since I last testified on this issue in December 2007, crude oil prices have increased from a monthly average of $92 per barrel (December 2007) to more than $135 per barrel in June 2008. Our current forecast is for crude oil prices to average $122 per barrel in 2008 and $126 per barrel in 2009. In addition, national average regular-grade retail gasoline prices have risen from $3.02 per gallon in December 2007 to $4.08 per gallon as of June 23, 2008. We are forecasting the price of regular-grade gasoline to average $3.78 for 2008 and $3.92 for 2009.

- As highlighted in our most recent monthly projections, several factors are combining to cause oil supply to struggle to keep up with demand growth, thereby accounting for much of the upward trend in oil prices. Our analysis to date suggests that market fundamentals—demand, supply (including actual or perceived supply disruptions), inventories, and spare production capacity—are the primary drivers of global oil prices. The current very tight oil market balances and the possibility of further supply disruptions are causing prices to rise to unprecedented highs.

- While fundamentals are the primary drivers of current oil markets, we are thinking about possible ways to use information about activity in the markets for energy derivatives to improve our forecasts. One of the challenges we face is that current measures that are used as proxies for speculative activity, such as total open interest in the New York Mercantile Exchange (NYMEX) futures market, net-long positions of non-commercial traders in the NYMEX futures market, and investment in commodity index funds, all have limitations. The development of better activity measures and more transparent information in these areas would facilitate our efforts.

- EIA relies on a number of tools to project crude oil prices, including an econometric model of oil production, inventories, and spare capacity; estimates of how disruptions affect or could affect prices; past oil price forecast errors; and extensive expert judgment on domestic and international oil markets.

- We continually strive to improve our short-term forecast in the face of considerable data gaps in key countries, changes in demand and supply that are not reflected in timely data, industry changes; new methods of estimation and forecasting; and more recently, financial factors that may be affecting the run-up of oil prices.

- Crude oil prices are the dominant determinant of gasoline prices. Motor gasoline prices also include the wholesale margin (the difference between the wholesale price of a gallon of gasoline and a gallon of crude oil), a retail margin reflecting the costs and profits associated with distribution to and sales by retail outlets, and taxes at the Federal state and local levels. EIA's short-term forecasts incorporate information on market conditions and events that cause the wholesale gasoline margin to vary significantly over time, for example, gasoline margins were high relative to historical norms last summer but are much lower this summer.

- Recent experience with very high and rapidly rising oil prices and large deviations of actual prices from forecast values highlight the challenges faced by EIA and other forecasters. While EIA's recent forecasts have missed the mark in absolute terms, they have outperformed the monthly forecasts by top consultancies in the industry over the past couple of years. We also track our projections versus the NYMEX futures contract, and we have consistently been equal or better than the Exchange at predicting oil prices 6 months into the future.

- EIA has already acted to improve both its short- and long-term modeling capabilities. In the short-term model, for example, we have added more regional detail and included expected levels of weather-related supply disruptions based on National Oceanic and Atmospheric Administration (NOAA) seasonal weather forecasts. Our Fiscal Year 2009 budget request proposes additional improvements in both the data quality used as input to models and in the modeling tools themselves. The budget request also supports several initiatives mandated in 2005 and 2007 energy legislation, including tracking and reporting of refinery outages and fuller integration of ethanol and other biofuels into our energy market data surveys.

EIA's Current Oil and Gasoline Price Forecast and Market Analysis

Each month EIA produces its *Short-Term Energy Outlook (STEO),* which provides a 13-24 month projection of U.S. and, where appropriate, global energy supplies, energy demands, and prices. The price of oil, in particular, the price of West Texas Intermediate (WTI) crude oil, the U.S. benchmark crude oil price, is one of the prices for which we provide monthly projections. Since I last testified on this issue in December 2007, WTI prices have increased from monthly average of $92 per barrel (December 2007) to

current levels of more than $135 per barrel. In our June *STEO*, we are forecasting WTI crude oil prices to average $122 per barrel in 2008 and $126 per barrel in 2009. In addition, national average regular-grade retail gasoline prices have risen from $3.02 per gallon in December 2007 to $4.08 per gallon as of June 23, 2008. We currently are forecasting the price of regular gasoline to average $3.78 for 2008 and $3.92 for 2009.

As highlighted in EIA's June *STEO*, several factors are combining to cause oil supply to struggle to keep up with demand growth, thereby accounting for much of the upward trend in oil prices. Based on our analysis to date, we believe that market fundamentals—demand, supply (including actual or perceived supply disruptions), inventories, and spare production capacity—are the primary drivers of global oil prices. The current very tight oil market balances, the possibility of further supply disruptions, and continued strong economic growth in emerging markets are causing prices to rise to unprecedented highs.

In recent months, there has been growing concern about the role oil futures and swaps markets are playing in the increase in WTI prices. In particular, what is causing the increase in the volume of trades? What is causing increased influx of index funds in the market? Is the increasing participation driving oil prices higher? Or are oil prices increasing participation? Is the inflow of speculators an appropriate focus of regulatory concern? Is the oil price best described as an asset price bubble?

Not surprisingly, there is a growing body of inconsistent opinion on the many issues surrounding futures market behavior and oil prices, and little systematic and comprehensive economic analysis. The Commodity Futures Trading Commission (CFTC), which has done extensive work in this area and is responsible for oversight and regulation of U.S. commodity futures markets, recently announced several initiatives to enhance the oversight of energy and agricultural futures markets, including creating the formation of a CFTC-led interagency task force. The task force, which includes representatives from the CFTC, Federal Reserve, Department of the Treasury, Securities and Exchange Commission, Department of Energy, and the Department of Agriculture, is examining investor practices, fundamental supply and demand factors, and the role of speculator and index traders in the commodity markets.

As outlined above, EIA's view is that oil markets today are characterized by strong demand, limited supply growth, and low spare capacity and that in the near-term, both the supply and demand curves for oil are now near-vertical. Any small shift in demand or supply, or even the perception of a supply shift due to possible supply disruptions, will result in significant price increases. However, the increased inflow of funds and participants in the futures markets, which I discuss below, may indeed affect oil prices to some degree in the short run, but are more likely symptomatic of the tight market conditions and resulting high prices, not the cause. Additional analysis is clearly needed, though we suspect it will be difficult to isolate precisely the impacts on oil prices. We hope our forecasts, and more importantly the thinking behind them, help everyone better understand the complexities of these continuously changing markets, the critical need for better and more transparent supply, demand, and trading data, and the need to constantly test new hypothesis with good analytic tools.

Analytical Methods

Oil Price Modeling

At EIA, we rely on a number of tools to project WTI prices, including an econometric model of oil production, inventories, and spare capacity; estimates of how disruptions affect or could affect WTI prices; past oil price forecast errors; and extensive expert judgment on domestic and international oil markets. We continually strive to improve our short-term forecast in the face of considerable data gaps in key countries, changes in demand and supply that are not reflected in timely data, industry changes; new methods of estimation and forecasting; and more recently, financial factors that may be affecting the run-up of oil prices.

Econometric Model. EIA has developed and documented an econometric model that looks at the crude oil market over the past 16 years. The model is one part of the information used to establish the *STEO* crude price projection each month. The model is regularly updated to reflect changing market conditions. For example, during the 1990s, much of the variation in crude oil prices could be explained by fluctuations in Organization for Economic Cooperation and Development (OECD) petroleum inventories[1]. During this time, there was the typical negative correlation between inventories and price (high prices, low inventories) in the period that ran from January 1992 through June 1999. Following the collapse in oil prices in 1999, the Organization of the Petroleum Exporting Countries (OPEC) acted to reestablish control of the crude oil market, pulling back on production, and pushing the price to $30 for a barrel of crude oil. Still, the negative correlation with inventories persisted. However, around June of 2004, this relationship shifted again, this time demonstrating a positive correlation between inventories and crude price. This implied additional market activity was likely not captured by the simple inventory-price relationship model.

Another market variable, excess crude oil production capacity, helps to explain the changing price behavior[2]. While EIA's analysis of crude oil prices found that the excess capacity variable added little additional explanatory power during the 1990s, in recent years, this variable improves the explanatory power of the model.

The situation continues to change. The current crude oil market seems to represent a condition of unstable equilibrium. The ultimate price path exhibits an upward-ratcheting or see-saw pattern around the underlying trend, rather than a smooth trajectory. This pattern is typical of commodity markets under these conditions. EIA is pursuing further work in this area that shows that recently the relationship between excess capacity and price becomes asymptotic, where small reductions in capacity can generate large price

[1] See for example, "Forecasting Crude Oil Spot Price Using OECD Petroleum Inventory Levels," Ye, Zyren, Shore, *International Advances in Economic Research* (2002) 8: 324-333; "A Monthly Crude Oil Spot Price Forecasting Model Using Relative Inventories," Ye, Zyren, Shore, *International Journal of Forecasting* (2005) 21: 491-501; and "Forecasting Short-Run Crude Oil Price Using High- and Low-Inventory Variables," Ye, Zyren, Shore, *Energy Police* (2006) 34: 2736-2743.

[2] "Short-Run Crude Oil Price and Surplus Production Capacity", Ye, Zyren, Shore, *International Advances in Economic Research* (2006) 12:390-394.

increases[3]. This behavior is well recognized in economic literature for industries in which large capital investment costs are required to develop new capacity and there is little scope for substituting other products to satisfy demand. For crude oil, it indicates that, somewhere in the range of 1 to 2 million barrels per day of spare production capacity, the market effectively approaches the industry's production limits, leaving only price to rebalance markets as demand grows.

The current version of the model reflects these changing market conditions and contains OECD industrial total petroleum inventory levels, excess crude oil production capacity, and a ratchet variable to capture recent behavior. But there is also room for improvements, and EIA is currently exploring ways to measure and forecast oil price volatility[4] and working to better understand trader behavior and measure its impact on crude oil prices changes, as discussed below.

Disruptions Model. EIA uses its Disruption Impact Simulator (DIS), which is a spreadsheet-based tool to estimate the impact of world oil supply disruptions on world oil prices and on the U.S. economy, to inform the short-term price path. Given the size of the disruption, DIS is able to project changes in world oil prices, the U.S. real gross domestic product (GDP), the U.S. unemployment rate, and the U.S. inflation rate. DIS relies on parameters specified by EIA economists, but is flexible to allow us to alter any of the parameters used in the model calculation to examine a range of "what if" cases. The DIS model is used in conjunction with other models when estimating the WTI price path; if there are concerns about potential disruptions, the DIS model helps us examine the impact on oil prices, which can be incorporated in the forecast.

Hurricane Assessments. EIA also develops an annual hurricane assessment, which we publish along with the *STEO* in May. The assessment, using NOAA's prediction regarding storms during the upcoming hurricane season (June 1 to November 30), estimates the amount of oil and natural gas that could potentially be shut in during the hurricane season. These estimates are taken into consideration when determining our near-term price forecast.

Motor Gasoline Price Modeling

Retail motor gasoline prices in the *STEO* model are forecast as a markup over the projected cost of crude oil. The difference between the pump price of gasoline and the price of crude oil is made up of three components: 1) the wholesale margin, which equals the gasoline wholesale spot price minus the refinery average cost of crude oil; 2) the retail margin, which reflects the costs and profits associated with distributing gasoline to retail outlets and selling it to consumers; and 3) Federal, state and local taxes..

[3] "The Recent Disconnect in Crude Oil Price and Inventory Relationship", Ye, Zyren, Shore, article to be published in upcoming issue of *Journal of Energy and Development.*

[4] See, for example, "Volatility Relationship between Crude Oil and Petroleum Products," Lee and Zyren, *Atlantic Economic Journal* (2007), 35:97-212.

The wholesale margin is modeled as a U.S. average while five regional equations are maintained at the Petroleum Administration for Defense District (PADD) level for both the retail margins and taxes. U.S. average retail margins and taxes are calculated by weighting regional margins by each region's estimated share of total U.S. gasoline consumption. In addition, PADD region finished gasoline and motor gasoline blend component inventory equations are also included. Consequently the *STEO* model for gasoline prices includes 26 separate regression equations.

The difference between the retail price of gasoline and the average refiner cost of crude over the last 5 years (January 2003 to December 2007) has ranged from a low of $0.73 per gallon (January 2003) to a high of $1.68 per gallon (May 2007). The greatest source variation in monthly margins is in the wholesale margin and the least variation is in taxes (**Table 1**).

The *STEO* model attempts to capture several market conditions and events that contribute to the observed variations in price margins. These include seasonality in demand; lags in the pass-through of crude oil prices to wholesale prices and from wholesale prices to retail prices; inventories that may be higher or lower than desired; and unusual one-time events that represent outliers that could bias the model results, e.g., 9/11, hurricanes.

However, no model can perfectly predict future price margin variation as current market events unfold in ways that have never been observed before. For example, EIA expected the current weakness in gasoline consumption and growth in ethanol supply would contribute to lower wholesale margins than had been seen over the last two summers. However, this combination of events had never been observed before, and wholesale gasoline margins so far this summer have been even lower than expected.

Oil Price Forecast Errors

Recent experience with very high and rapidly rising oil prices and large deviations of actual prices from forecast values highlights the challenges faced by EIA and other forecasters. While EIA's recent forecasts have definitely missed the mark in absolute terms, EIA's forecasts over the last couple of years have outperformed the monthly forecasts by top consultancies in the industry. We also track our projections versus the NYMEX futures contract, and we have consistently been equal or better than the Exchange at predicting oil prices 6 months into the future.

EIA, the other forecasters, and the NYMEX futures market have generally under-forecast the steady increase in the WTI spot price over the last 5 years, but EIA's average 6-month forecast error is the smallest. WTI forecast errors over the last 5 years have tended to increase for all forecasters and NYMEX as the forecast horizon lengthens, but EIA's forecast error compares favorably to others for all horizons between 6 and 24 months.

Market Fundamentals

Supply, Demand, Inventories and Spare Capacity. In EIA's view, recent price increases are an extension of oil market developments originating in the 1990s with relatively high inventories, ample surplus production capacity, and oil prices fluctuating around $20 per barrel. When spot prices moved above or below this level, the price of futures contracts requiring delivery in distant months generally traded close to the $20 level, consistent with a market expectation that producers would ensure that spot prices would eventually return to that level.

However, as leading OPEC member countries shifted towards a tight inventory policy and global oil demand recovered from the slowing effect of Asia's financial crisis, the global market balance tightened, and inventories declined sharply at the beginning of the present decade. Oil prices rose to $30 per barrel, in what might be seen as the first leg of the upward trend. By 2003, inventories were drawn down sufficiently such that subsequent increases in global demand stretched oil production to levels near capacity. The large, unexpected jump in world oil demand growth in 2004, fostered by strong growth in economic activity in Asia and the United States, reduced excess production capacity significantly.

Now, in mid-2008, oil prices have increased by almost 300 percent since January 2003, but despite higher prices, world oil demand growth remains relatively strong. Since 2003, world oil consumption growth has averaged 1.8 percent per year (**Figure 1**). Non-OECD countries, especially China, India, and the Middle East, represent the largest part of this growth, while at the same time overall non-OPEC supply growth has slowed (**Figure 2**). In the past 3 years, non-OPEC supply growth has been well below levels seen just 4 years ago. As a result, the world oil market balance has tightened significantly (**Figure 3**). World oil consumption growth has simply outpaced non-OPEC supply growth every year since 2003. This imbalance increases reliance upon OPEC production and/or inventories to fill the gap.

World surplus production capacity remains low, at an estimated 1.7 million barrels per day for 2008, which is well below the 1996-2003 annual average of 3.9 million barrels per day (**Figure 4**). This puts additional upward pressure on prices, leaving world oil markets vulnerable to supply disruptions. In addition, this surplus capacity is highly concentrated in a few countries, with Saudi Arabia holding almost all of this capacity. Without significant surplus capacity, market participants can no longer rely on increased production from key members of OPEC to offset supply disruptions and restore balance to avoid significant price changes, as they did in the 1990s. Industry recognizes the need for new capacity investments, but those additions are costly and come with a significant lag.

As for inventories, OECD stocks were at record lows in 2003, following the strike in Venezuela. Preliminary OECD inventory data for the first part of 2008 show that OECD stocks have again fallen below the levels seen in 1996-2002. Because oil use has been growing over time, inventories are even tighter when considered on a "days of supply"

basis. In addition, U.S. inventories for crude oil and key petroleum products are all relatively low. After remaining relatively high for much of 2006 and the first half of 2007, U.S. crude oil inventories have fallen towards the bottom end of the average range, even as refinery throughputs have been low so far this year.

Geopolitical Uncertainty. There is currently a high degree of uncertainty in world oil markets due to fears of the availability of oil supplies. EIA takes these factors into consideration when we produce the monthly *STEO* report.

Current world oil supplies are highly concentrated. In 2007, the top ten oil producers represented about half of total world supply. In addition, geopolitical risk surrounds many of these top producers, either because of current supply disruptions (Nigeria and Iraq) or the perceived threat of a disruption (Iran and Venezuela). Finally, as previously discussed, there is very little surplus production capacity available to offset any disruption. In May 2008, there was an estimated 1.4 million barrels per day of surplus production capacity, all located in Saudi Arabia, which represents just 2 percent of world oil demand. The combination of these factors means that prices react very strongly to any actual or perceived supply disruption (**Figure 5**).

Supply disruptions are a frequent occurrence in the oil industry. During the past 24 months, there have been almost two dozen supply disruptions, lasting from a few days to many weeks, which affected world oil production and exports. These were caused by power failures, workers strikes, pipeline leaks and explosions, cyclones and hurricanes, saboteurs, and civil wars. Over half of these resulted in oil production outages of over 100,000 barrels per day. The most significant disruption resulted from the ongoing strife in Iraq and Nigeria. These disruptions have varied in size over time, with Iraq losing over 500,000 barrels per day of exports in March 2008 and Nigeria reaching over 1.4 million barrels per day of shut-in production at one point in April.

While actual supply disruptions directly affect world oil markets due to a loss of physical barrels available to the market, much of the impact of supply disruptions is due to market perception of the situation. This situation is reinforced by the limited amount of spare production capacity available. As long as potential disruptions, both real (e.g., Iraq and Nigeria) or perceived (e.g.., concerns about the potential loss of supply from Iran), exceed the amount of additional production capacity that can be brought online quickly, geopolitical concerns will weigh heavily on oil markets.

When constructing our short-term outlook, we take into consideration the current disruptions and the potential for additional disruptions, including the probability that severe weather could impact oil and natural U.S. production, refining, and transport operations as it did in 2005. The specific impacts of these effects vary from month to month.

Value of the U.S. Dollar. Between January 2007 and March 2008, the value of the dollar against the Euro fell by 29 percent while the price of WTI crude oil rose by 93 percent. Some analysts have pointed to these common trends as an indicator that the declining

value of the dollar has contributed to higher oil prices. However, during other periods we have seen oil prices rise even as the value of the dollar remain unchanged or even rose. For example, between November 2004 and November 2006, the value of the dollar strengthened by 12 percent against the Euro, while the WTI spot price rose by 35 percent. Since early March 2008, the dollar has held its value against the Euro while WTI spot prices increased from $102 per barrel to a peak of over $138 per barrel.

Exchange rates, like oil prices, are signals that transmit information on underlying fundamentals. As in the international oil market, where changes in oil prices bring oil demand into balance with oil supply, changes in exchange rates are among the signals, along with interest rates, that equate the demand for money and credit with their supply.

There has been no systematic and stable relationship between oil prices and exchange rates over time, which makes econometric analysis problematic. In the current economic environment, it is difficult to parse out econometrically the effects of constrained oil supply growth, strong world GDP growth, and the decline in expected rates of return on U.S. assets and their greater risk relative to foreign assets as reflected in the weaker dollar. Furthermore, inconsistent price signals caused by the global patchwork of petroleum product subsidies may limit the effect of high relative oil world prices on demand, particularly in the developing world.

Financial Markets and Oil Prices

Financial investments in commodities have surged over the last few years as commodities are increasingly being used for portfolio diversification and as a hedge against inflation and the weakness of the U.S. economy and the dollar, in addition to their traditional roles as providing opportunities to hedge or speculate on price changes. Commodities have become attractive as financial assets because of the continued tight balances within many commodity markets (i.e., strong demand for commodities in emerging markets, sluggish supply response to higher prices, low inventories, and low spare capacity), leading to uncertainty about future prices.

Of particular interest has been the growth in commodity index funds. Traditionally, commodities have been "bought to use" rather than "bought to hold." In other words, a hedging company would buy or sell oil with the intent to make use of it in a specified timeframe. A trader would buy or sell to later sell or buy before some specified timeframe. An investor in equities such as a commodities index fund, on the other hand, will buy to hold, or even bequeath. Investors in equities will adjust their exposure to various risks based on a portfolio that changes with price, but not very directly.

Econometric estimation of the influence of futures market participation or speculation on oil prices is problematic because of the difficulty in measuring the volume and direction of speculation. Current measures that are used as proxies for speculative activity, such as total open interest in the NYMEX futures market, net-long positions of non-commercial traders in the NYMEX futures market, and investment in commodity index funds, all have limitations. For this reason, we really do not know the total size and nature of

commodity index fund activity and speculation. The development of better activity measures and more transparent information in these areas would facilitate additional analysis of these issues.

Turning to the measures, albeit imperfect, that are available today, open market interest on the NYMEX for light sweet crude oil futures and options contracts has increased from about 666,000 contracts (each contract is for 1,000 barrels of crude oil) on June 24, 2003, to 3,150,000 contracts on May 13, 2008. Over this period the price of WTI crude oil has increased from $30 to $125 per barrel.

One could expect the futures market to affect oil prices over the very short run (hours and days) through the transmission of new information that may be distorted through the participation of uninformed investors or "herding" behavior. However, over the longer run (months and years), it is not obvious that speculation or increased participation in the futures market "causes" higher prices in the physical market. Instead, increased futures market activity may simply be a response, in the same way oil prices are, to continuing tightness and uncertainty in the physical markets.

Though one might expect that the level of open interest on the NYMEX is correlated with speculative activity, the relationship between total open interest and price is unclear. For example, if speculators entered the market expecting prices to rise, they would presumably attempt to take long positions on oil futures contracts, bidding up the price. However, if speculators entered the market expecting prices to fall, they would presumably attempt to take short positions on oil futures contracts, driving down the price. While both of these scenarios would increase open interest, they would each have opposite effects on the price of oil futures contracts.

Because of the ambiguity of total open interest as a measure of the direction of speculation and its price impact, the relationship between long contracts and short contracts held by non-commercial traders, traders who do not claim to be hedging at all, has been used as a proxy to indicate the direction of speculative interest. When non-commercial traders are "net long" (the number of long contracts exceeds the number of short contracts), it is presumed that speculators are betting on increases in price. If a preponderance of them are making these bets, then the price can increase based solely on their own demand. However, the distinction between commercial and non-commercial traders is weak. For example, speculative investments in commodity index funds are categorized as commercial rather than non-commercial trades.

The non-commercial net long positions in crude oil have not been consistently correlated with oil prices. Over the first half of 2007, both non-commercial net long positions in light sweet crude oil and crude oil prices increased. However, the number of net-long positions at the end of May 2008 was no higher than they were in June 2007 even though oil prices have almost doubled over this period. Moreover, in the natural gas market, between November 2006 and January 2007, non-commercial positions fell from a net long 29,000 contracts to a net short 113,000 contracts while natural gas prices rose slightly.

The third proxy for speculative activity in commodity markets is the total amount of money invested in commodity index funds. However, under the Commodity Futures Modernization Act of 2000, the total amount of money invested in commodity index funds is not publicly reported. Thus, estimates of assets under management in index funds and the share of those funds that are hedged on the NYMEX crude oil futures market vary widely, making any statistical analysis using these data suspect.

Conclusion

Mr. Chairman and members of the subcommittee, EIA has already acted to improve both its short-term and long-term modeling capabilities. Further significant improvements in both the data used as input to models and modeling tools are proposed in our Fiscal Year 2009 budget request. The budget request also supports several initiatives mandated in 2005 and 2007 energy legislation, including tracking and reporting of refinery outages and fuller integration of ethanol and other biofuels into our energy survey systems.

While EIA believes that fundamental factors such as strong demand growth, a dramatic decline in global surplus crude oil production capacity, and global refining capacity constraints are the major factors driving oil prices higher, we share your interest in exploring how information from markets in energy derivatives could be used to improve forecasts of oil and motor gasoline prices. One key challenge to pursuing this line of analysis is the difficulty in measuring the volume and direction of speculation and commodity fund activity with currently available proxies. We really do not know the total size and nature of commodity index fund activity and speculation. The development of better activity measures and more transparent information in these areas would facilitate additional econometric analysis of these issues.

This concludes my testimony, Mr. Chairman and members of the Committee. I would be glad to answer any questions you may have.

Table 1. Minimum and Maximum Monthly Average Price Margins, Jan. 2003 – Dec. 2007 (cents per gallon)

	Minimum Monthly Margin	Maximum Monthly Margin
Wholesale margin	22.0	102.8
Retail margin	8.2	26.0
Taxes	42.3	53.9
Total retail gasoline – crude oil margin	73.1	167.8

The minimum and maximum margins may not sum to the total margins because they may occur in different months.

Figure 1

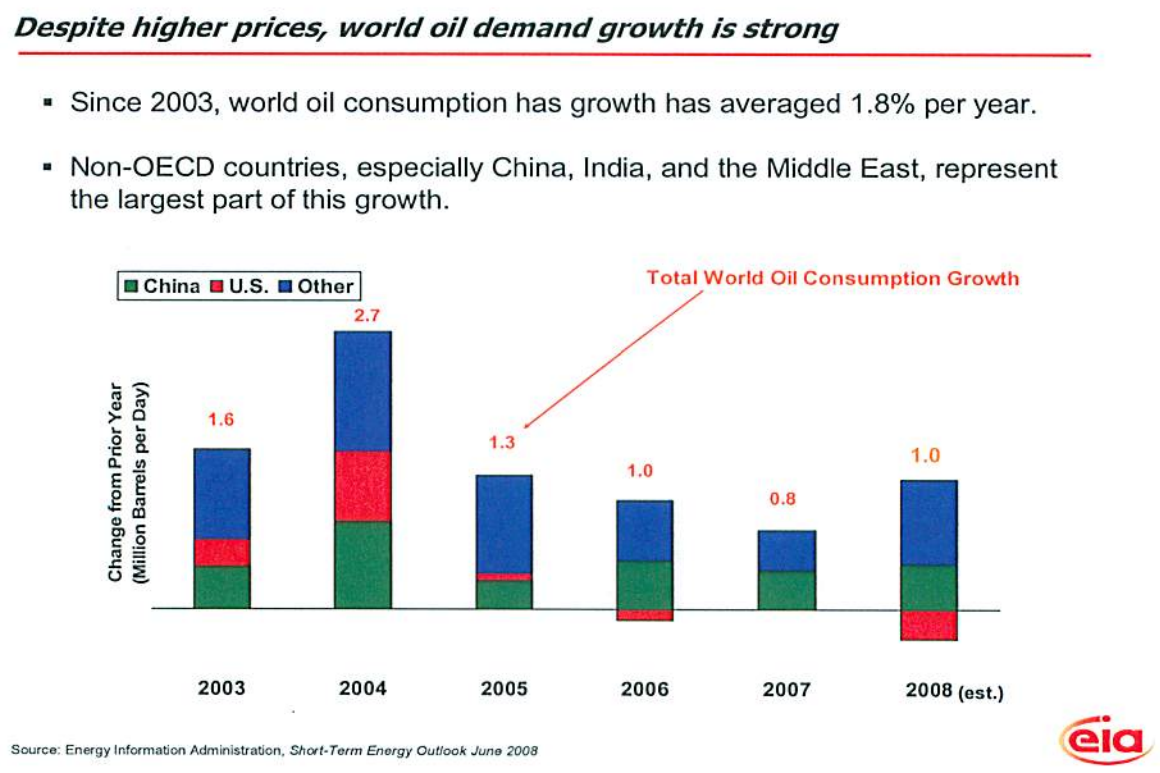
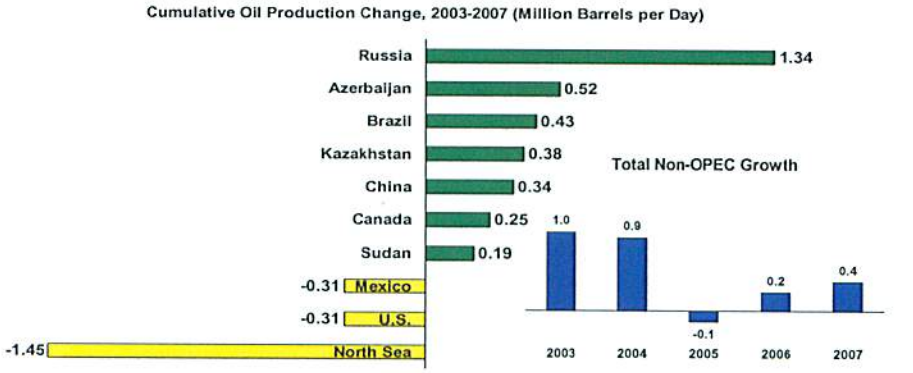


Figure 2

Non-OPEC supply growth has slowed in recent years.

- In the past three years, non-OPEC supply growth has been well below levels seen just four years ago.
- Russia drove non-OPEC supply growth during the first part of the decade. However, Russian oil production is down year-over-year in 2008.

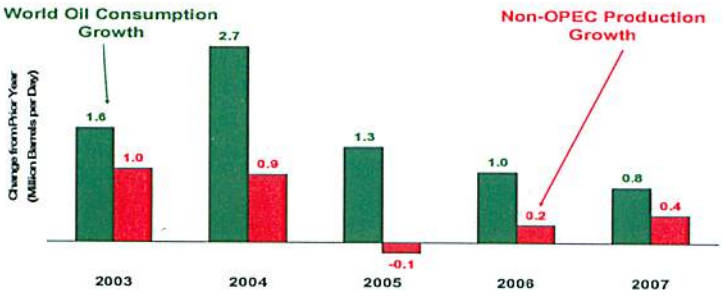


Source: Energy Information Administration, *Short-Term Energy Outlook June 2008*

Figure 3

World oil market balance has tightened significantly.

- World oil consumption growth has outpaced non-OPEC supply growth every year since 2003.
- This imbalance increases reliance upon OPEC production and/or inventories to fill the gap.

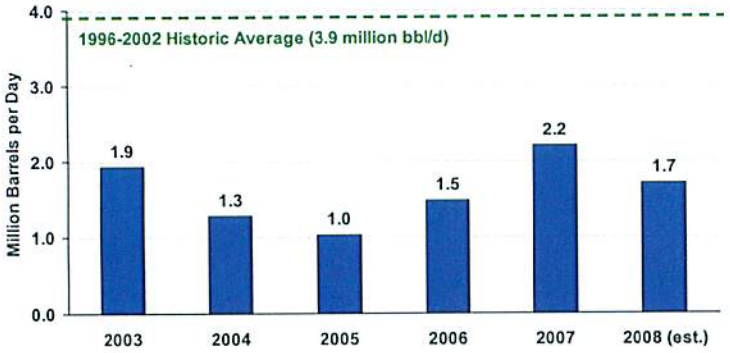


Source: Energy Information Administration, *Short-Term Energy Outlook June 2008*

Figure 4

World surplus production capacity remains low, leaving world oil markets vulnerable to supply disruptions.

- Current world surplus production capacity is below historic levels.
- In addition, it is highly concentrated in a few countries, with Saudi Arabia holding almost all of this capacity.

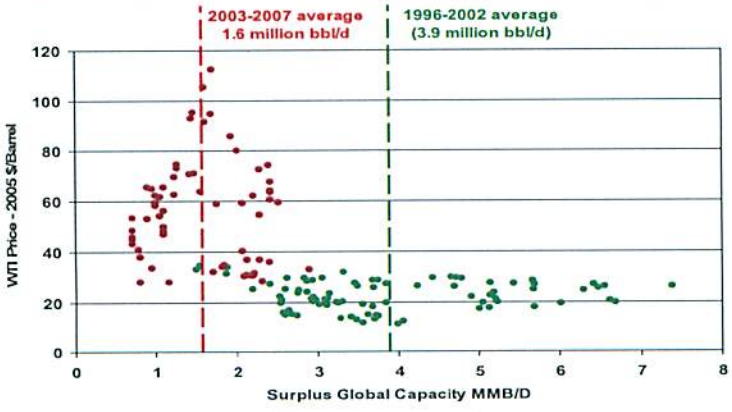


Source: Energy Information Administration, *Short-Term Energy Outlook June 2008*

Figure 5

At low levels of spare capacity, oil prices tend to increase dramatically.

- Prices respond when surplus capacity is low, particularly when geopolitical turmoil or other events such as hurricanes threaten supply.
- Consider the potential for loss of production in any of these countries: Iraq at 2.0 million barrels per day, Iran at 3.8 million barrels per day, Venezuela at 2.4 million barrels per day, Nigeria at 2.3 million barrels per day.



Source: Reuters; EIA