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ENERGY MARKETS

Factors Contributing to Higher Gasoline Prices

Statement of Jim Wells, Director
Natural Resources and Environment

February 1, 2006

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Factors Contributing to Higher Gasoline Prices

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Highlights

Highlights of GAO-06-412T, a report to the Committee on the Judiciary, United States Senate

Why GAO Did This Study

Soaring retail gasoline prices, increased oil company profits, and mergers of large oil companies have garnered extensive media attention and generated considerable public concern. Gasoline prices impact the economy because of our heavy reliance on motor vehicles. According to the Department of Energy's Energy Information Administration (EIA), each additional ten cents per gallon of gasoline adds about $14 billion to America's annual gasoline bill.

Given the importance of gasoline for the nation's economy, it is essential to understand the market for gasoline and how prices are determined. In this context, this testimony addresses the following questions: (1) What factors affect gasoline prices? (2) What has been the pattern of oil company mergers in the United States in recent years? (3) What effects have mergers had on market concentration and wholesale gasoline prices?

To address these questions, GAO relied on previous reports, including (1) a 2005 GAO primer on gasoline prices, (2) a 2005 GAO report on the proliferation of special gasoline blends, and (3) a 2004 GAO report on mergers in the U.S. petroleum industry. GAO also collected updated data from a number of sources that we deemed reliable. This work was performed in accordance with generally accepted government auditing standards.

www.gao.gov/cgi-bin/getrpt?GAO-06-412T.

To view the full product, including the scope and methodology, click on the link above. For more information, contact Jim Wells at (202) 512-3841 or wellsj@gao.gov..

What GAO Found

Crude oil prices are the major determinant of gasoline prices. A number of other factors also affect gasoline prices including (1) refinery capacity in the United States, which has not expanded at the same pace as demand for gasoline and other petroleum products in recent years; (2) gasoline inventories maintained by refiners or marketers of gasoline, which as with trends in a number of other industries, have seen a general downward trend in recent years; and (3) regulatory factors, such as national air quality standards, that have induced some states to switch to special gasoline blends that have been linked to higher gasoline prices. Finally, the structure of the gasoline market can play a role in determining prices. For example, mergers raise concerns about potential anticompetitive effects because mergers could result in greater market power for the merged companies, potentially allowing them to increase prices above competitive levels.

During the 1990s, the U.S. petroleum industry experienced a wave of mergers, acquisitions, and joint ventures, several of them between large oil companies that had previously competed with each other for the sale of petroleum products. During this period, more than 2,600 merger transactions occurred—almost 85 percent of the mergers occurred in the upstream segment (exploration and production), while the downstream segment (refining and marketing of petroleum) accounted for about 13 percent, and the midstream segment (transportation) accounted for about 2 percent. Since 2000, we found that at least 8 additional mergers have occurred, involving different segments of the industry. Petroleum industry officials and experts we contacted cited several reasons for the industry's wave of mergers since the 1990s, including increasing growth, diversifying assets, and reducing costs.

Mergers in the 1990s contributed to increases in market concentration in the refining and marketing segments of the U.S. petroleum industry, while the exploration and production segment experienced little change in concentration. GAO evaluated eight mergers that occurred in the 1990s after they had been reviewed by the FTC—the FTC generally reviews proposed mergers involving the petroleum industry and only approves such mergers if they are deemed not to have anticompetitive effects. GAO's econometric modeling of these mergers showed that the majority resulted in small wholesale gasoline price increases. While mergers since 2000 also increased market concentration, we have not performed modeling on more recent mergers and thus cannot comment on any potential additional effect on wholesale gasoline prices.

Mr. Chairman and Members of the Committee:

I am pleased to participate in the Committee's hearing to discuss the factors that influence gasoline prices, including oil company mergers. Soaring retail gasoline prices, increased oil company profits, and mergers of large oil companies have garnered extensive media attention and generated considerable public concern, particularly in the immediate aftermath of hurricanes Katrina and Rita. More recently, retail gasoline prices have fallen from those extremes but remain considerably higher than they were for much of the past decade. In 2004, the United States consumed about 20.5 million barrels per day of crude oil accounting for roughly 25 percent of world oil production. About half of the crude oil consumed in this country goes into production of gasoline. High gasoline prices impact the economy because of our heavy reliance on motor vehicles—the United States consumes roughly 45 percent of all gasoline consumed in the world. To put this in context, according to the Department of Energy's Energy Information Administration (EIA), nationally, each additional ten cents per gallon of gasoline adds about $14 billion to America's annual gasoline bill.

Data from the Energy Information Administration (EIA) indicate that there are currently 149 refineries in the United States with a total crude oil distillation capacity of about 16.9 million barrels per day. Demand for petroleum products has been rising at a faster rate than domestic refining capacity and the difference has come from imports, including gasoline from Europe. Although refining capacity has risen gradually since the mid 1980s as refineries are upgraded, no new major refinery has been built on the U.S. mainland in the last 25 years. Looking forward, domestic demand for petroleum products is projected to increase by about 20 percent by 2020, raising concerns about our ability to satisfy growing demand for gasoline and other petroleum products without increasingly relying on imports.

Given the importance of gasoline for our economy, it is essential to understand the market for gasoline and how prices are determined. In this context, this testimony addresses the following questions: (1) What factors affect gasoline prices? (2) What has been the pattern of oil company mergers in the United States in recent years? (3) What effects have mergers had on market concentration and wholesale gasoline prices?

To address these questions, we relied on previous GAO reports on gasoline prices and other aspects of the petroleum industry, including (1) a 2005 GAO primer on gasoline prices, (2) a 2005 GAO report on the

proliferation of special gasoline blends, and (3) a 2004 GAO report on mergers in the U.S. petroleum industry.[1] We also collected updated data from a number of sources that we deemed reliable. This work was performed in accordance with generally accepted government auditing standards.

In summary we found the following:

- Crude oil prices are the fundamental determinant of gasoline prices. A number of other factors also affect gasoline prices including (1) refinery capacity in the United States, which has not expanded at the same pace as demand for gasoline in recent years; (2) gasoline inventories maintained by refiners or marketers of gasoline, which have seen a general downward trend in recent years; and (3) regulatory factors, such as national air quality standards, that have induced some states to switch to special gasoline blends that have been linked to higher gasoline prices. Finally, the structure of the gasoline market can play a role in determining prices. For example, mergers raise concerns about potential anticompetitive effects because mergers could result in greater market power for the merged companies, potentially allowing them to increase prices above competitive levels.

- The 1990s saw a wave of merger activity in which over 2600 mergers occurred involving all three segments of the U.S. petroleum industry—almost 85 percent of the mergers occurred in the upstream segment (exploration and production), while the downstream segment (refining and marketing of petroleum) accounted for about 13 percent, and the midstream segment (transportation) accounted for about 2 percent. Since 2000, we found that at least 8 additional mergers have occurred, involving different segments of the industry.

- This wave of mergers contributed to increases in market concentration in the refining and marketing segments of the U.S. petroleum industry. Econometric modeling we performed of eight mergers that occurred in the 1990s showed that the majority resulted in small wholesale gasoline price increases—changes were generally between about 1 and 7 cents per

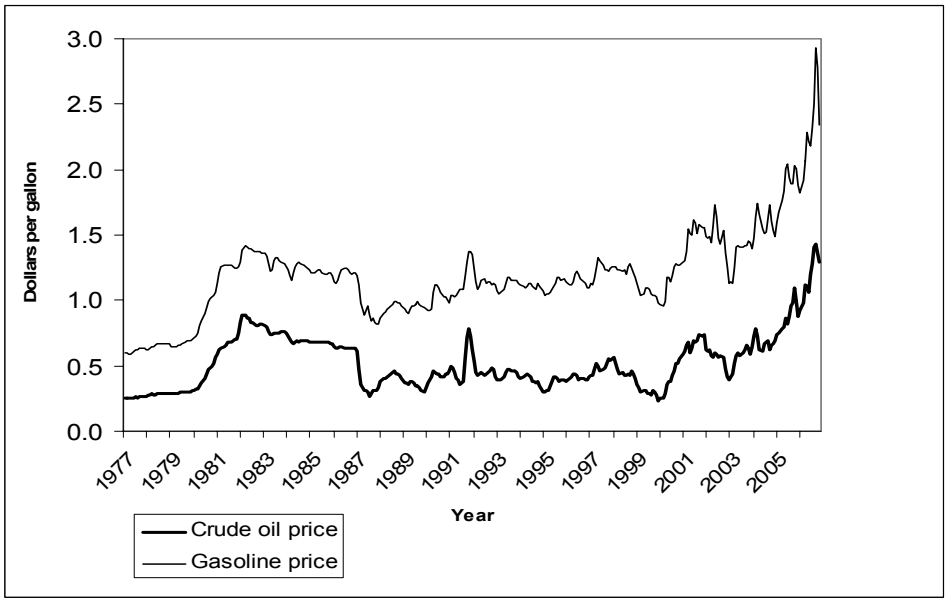
[1]See U.S. GAO, *Energy Markets: Effects of Mergers and Market Concentration in the U.S. Petroleum Industry*, GAO-04-96 (Washington, D.C.: May 17, 2004); U.S. GAO, *Motor Fuels: Understanding the Factors That Influence the Retail Price of Gasoline*, GAO-05-525SP (Washington, D.C.: May 2, 2005); and U.S. GAO, *"Gasoline Markets: Special Gasoline Blends Reduce Emissions and Improve Air Quality, but Complicate Supply and Contribute to Higher Prices,"* GAO-05-421, (Washington, D.C.: June 17, 2005).

gallon. The 8 additional mergers since 2000 did increase the level of industry concentration. However, because we have not performed modeling on these mergers, we cannot comment on any potential additional effect on wholesale gasoline prices.

Crude Oil Prices and Other Factors Affect Gasoline Prices

Crude oil prices are the fundamental determinant of gasoline prices. As figure 1 shows, crude oil and gasoline prices have generally followed a similar path over the past three decades and have risen considerably over the past few years.

Figure 1: Gasoline and Crude Oil Prices—1976-2005 (Not adjusted for inflation)



Source: GAO analysis of data from the Energy Information Administration, Department of Energy, Monthly Energy Review, Monthly Refiner Acquisition Cost of Crude Oil, Composite and Monthly Motor Gasoline Prices, U.S. City Averages, Regular Unleaded Gasoline.

Refining capacity also plays a role in determining how gasoline prices vary across different locations and over time. Refinery capacity in the United States has not expanded at the same pace as demand for gasoline and other petroleum products in recent years. The American Petroleum Institute recently reported that U.S. average refinery capacity utilization has increased to 92 percent. As a result, domestic refineries have little room to expand production in the event of a temporary supply shortfall. Furthermore, the fact that imported gasoline comes from farther away than domestically produced gasoline means that when supply disruptions

occur in the United States it might take longer to get replacement gasoline than if we had excess refining capacity in the United States. This could cause gasoline prices to rise and stay high until the imported supplies can reach the market.

Gasoline inventories maintained by refiners or marketers of gasoline can also have an impact on prices. As have a number of other industries, the petroleum products industry has adopted so-called "just-in-time" delivery processes to reduce costs leading to a downward trend in the level of gasoline inventories in the United States. For example, in the early 1980s private companies held stocks of gasoline in excess of 35 days of average U.S. consumption, while in 2004 these stocks were equivalent to less than 25 days consumption. While lower costs of holding inventories may reduce gasoline prices, lower levels of inventories may also cause prices to be more volatile because when a supply disruption occurs, there are fewer stocks of readily available gasoline to draw from, putting upward pressure on prices.

Regulatory factors also play a role. For example, in order to meet national air quality standards under the Clean Air Act, as amended, many states have adopted the use of special gasoline blends—so-called "boutique fuels." As we reported in a recent study, there is a general consensus that higher costs associated with supplying special gasoline blends contribute to higher gasoline prices, either because of more frequent or more severe supply disruptions, or because higher costs are likely passed on, at least in part, to consumers.

Finally, the structure of the gasoline market can play a role in determining prices. For example, mergers raise concerns about potential anticompetitive effects because mergers could result in greater market power for the merged companies, potentially allowing them to increase prices above competitive levels.[2] On the other hand, mergers could also yield cost savings and efficiency gains, which may be passed on to consumers through lower prices. Ultimately, the impact depends on whether market power or efficiency dominates.

[2]Federal Trade Commission and Department of Justice have defined market power for a seller as the ability profitably to maintain prices above competitive levels for a significant period of time.

Mergers Occurred in All Segments of the U.S. Petroleum Industry in Recent Years for Several Reasons

During the 1990s, the U.S. petroleum industry experienced a wave of mergers, acquisitions, and joint ventures, several of them between large oil companies that had previously competed with each other for the sale of petroleum products.[3] More than 2,600 merger transactions have occurred since 1991 involving all three segments of the U.S. petroleum industry. Almost 85 percent of the mergers occurred in the upstream segment (exploration and production), while the downstream segment (refining and marketing of petroleum) accounted for about 13 percent, and the midstream segment (transportation) accounted for about 2 percent. The vast majority of the mergers—about 80 percent—involved one company's purchase of a segment or asset of another company, while about 20 percent involved the acquisition of a company's total assets by another so that the two became one company.

Most of the mergers occurred since the second half of the 1990s, including those involving large partially or fully vertically integrated companies. For example, in 1998 British Petroleum (BP) and Amoco merged to form BPAmoco, which later merged with ARCO, and in 1999 Exxon, the largest U.S. oil company merged with Mobil, the second largest. Since 2000, we found that at least 8 large mergers have occurred. Some of these mergers have involved major integrated oil companies, such as the Chevron-Texaco merger, announced in 2000, to form ChevronTexaco, which went on to acquire Unocal in 2005. In addition, Phillips and Tosco announced a merger in 2001 and the resulting company, Phillips, then merged with Conoco to become ConocoPhillips. Independent oil companies have also been involved in mergers. For example, Devon Energy and Ocean Energy, two independent oil producers, announced a merger in 2003 to become the largest independent oil and gas producer in the United States.

Petroleum industry officials and experts we contacted cited several reasons for the industry's wave of mergers since the 1990s, including increasing growth, diversifying assets, and reducing costs. Economic literature indicates that enhancing market power is also sometimes a motive for mergers, which could reduce competition and lead to higher prices. Ultimately, these reasons mostly relate to companies' desire to maximize profits or stock values.

[3]We refer to all of these transactions as mergers.

Mergers in the 1990s Increased Market Concentration and Led to Small Increases in Wholesale Gasoline Prices, but the Impact of More Recent Mergers is Unknown

Mergers in the 1990s contributed to increases in market concentration in the refining and marketing segments of the U.S. petroleum industry, while the exploration and production segment experienced little change in concentration. Econometric modeling we performed of eight mergers that occurred in the 1990s showed that the majority resulted in small wholesale gasoline price increases. The effects of some of the mergers were inconclusive, especially for boutique fuels sold in the East Coast and Gulf Coast regions and in California. While we have not performed modeling on mergers that occurred since 2000, and thus cannot comment on any potential additional effect on wholesale gasoline prices, these mergers would further increase market concentration nationwide since there are now fewer oil companies.

Proposed mergers in all industries are generally reviewed by federal antitrust authorities—including the Federal Trade Commission (FTC) and the Department of Justice (DOJ)—to assess the potential impact on market competition and consumer prices. According to FTC officials, FTC generally reviews proposed mergers involving the petroleum industry because of the agency's expertise in that industry. To help determine the potential effect of a merger on market competition, FTC evaluates, among other factors, how the merger would change the level of market concentration. Conceptually, when market concentration is higher, the market is less competitive and it is more likely that firms can exert control over prices.

DOJ and FTC have jointly issued guidelines to measure market concentration. The scale is divided into three separate categories: unconcentrated, moderately concentrated, and highly concentrated. The index of market concentration in refining increased all over the country during the 1990s, and changed from moderately to highly concentrated on the East Coast. In wholesale gasoline markets, market concentration increased throughout the United States between 1994 and 2002. Specifically, 46 states and the District of Columbia had moderately or highly concentrated markets by 2002, compared to 27 in 1994.

While market concentration is important, other aspects of the market that may be affected by mergers also play an important role in determining the level of competition in a market. These aspects include barriers to entry, which are market conditions that provide established sellers an advantage over potential new entrants in an industry, and vertical integration. Mergers may have also contributed to changes in these aspects. However, we could not quantify the extent of these changes because of a lack of relevant data.

To estimate the effect of mergers on wholesale gasoline prices, we performed econometric modeling on eight mergers that occurred during the 1990s: Ultramar Diamond Shamrock (UDS)-Total, Tosco-Unocal, Marathon-Ashland, Shell-Texaco I (Equilon), Shell-Texaco II (Motiva), BP-Amoco, Exxon-Mobil, and Marathon Ashland Petroleum (MAP)-UDS.

- For the seven mergers that we modeled for conventional gasoline, five led to increased prices, especially the MAP-UDS and Exxon-Mobil mergers, where the increases generally exceeded 2 cents per gallon, on average.
- For the four mergers that we modeled for reformulated gasoline, two—Exxon-Mobil and Marathon-Ashland—led to increased prices of about 1 cent per gallon, on average. In contrast, the Shell-Texaco II (Motiva) merger led to price decreases of less than one-half cent per gallon, on average, for branded gasoline only.
- For the two mergers—Tosco-Unocal and Shell-Texaco I (Equilon)—that we modeled for gasoline used in California, known as California Air Resources Board (CARB) gasoline, only the Tosco-Unocal merger led to price increases. The increases were for branded gasoline only and were about 7 cents per gallon, on average.

Our analysis shows that wholesale gasoline prices were also affected by other factors included in the econometric models, including gasoline inventories relative to demand, supply disruptions in some parts of the Midwest and the West Coast, and refinery capacity utilization rates.

Concluding Observations

Our past work has shown that, crude oil price is the fundamental determinant of gasoline prices. Refinery capacity, gasoline inventory levels and regulatory factors also play important roles. In addition, merger activity can influence gasoline prices. During the 1990s, mergers decreased the number of oil companies and refiners and our findings suggest that this change caused wholesale prices to rise. The impact of more recent mergers is unknown. While we have not performed modeling on mergers that occurred since 2000, and thus cannot comment on any potential additional effect on wholesale gasoline prices, these mergers would further increase market concentration nationwide since there are now fewer oil companies.

Our analysis of mergers during the 1990s differs from the approach taken by the FTC in reviewing potential mergers because our analysis was retrospective in nature—looking at actual prices and estimating the

impacts of individual mergers on those prices—while FTC's review of mergers takes place necessarily before the mergers. Going forward, we believe that, in light of our findings, both forward looking and retrospective analysis of the effects of mergers on gasoline prices are necessary to ensure that consumers are protected from anticompetitive forces. In addition, we welcome this hearing as an opportunity for continuing public scrutiny and discourse on this important issue. We encourage future independent analysis by the FTC or other parties, and see value in oversight of the regulatory agencies in carrying out their responsibilities.

Regardless of the causes, high gasoline prices specifically, and high energy prices in general are a challenge for the nation. Rising demand for energy in the United States and across the world will put upward pressure on prices with potentially adverse economic impacts. Clearly none of the options for meeting the nation's energy needs are without tradeoffs. Current U.S. energy supplies remain highly dependent on fossil energy sources that are costly, imported, potentially harmful to the environment, or some combination of these three, while many renewable energy options are currently more costly than traditional options. Striking a balance between efforts to boost supplies from alternative energy sources and policies and technologies focused on improved efficiency of petroleum burning vehicles or on overall energy conservation present challenges as well as opportunities. How we choose to meet the challenges and seize the opportunities will help determine our quality of life and economic prosperity in the future.

We are currently studying gasoline prices in particular, and the petroleum industry more generally, including an analysis of the viability of the Strategic Petroleum Reserve, an evaluation of world oil reserves, and an assessment of U.S. contingency plans should oil imports from a major oil producing country, such as Venezuela, be disrupted. With this body of work, we will continue to provide Congress and the American people the information needed to make informed decisions on energy that will have far-reaching effects on our economy and our way of life.

Mr. Chairman, this completes my prepared statement. I would be happy to respond to any questions you or the other Members of the Subcommittee may have at this time.

GAO Contacts and Staff Acknowledgments

For further information about this testimony, please contact me at (202) 512-3841 (or at wellsj@gao.gov). Godwin Agbara, Samantha Gross, John Karikari, and Frank Rusco made key contributions to this testimony.

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