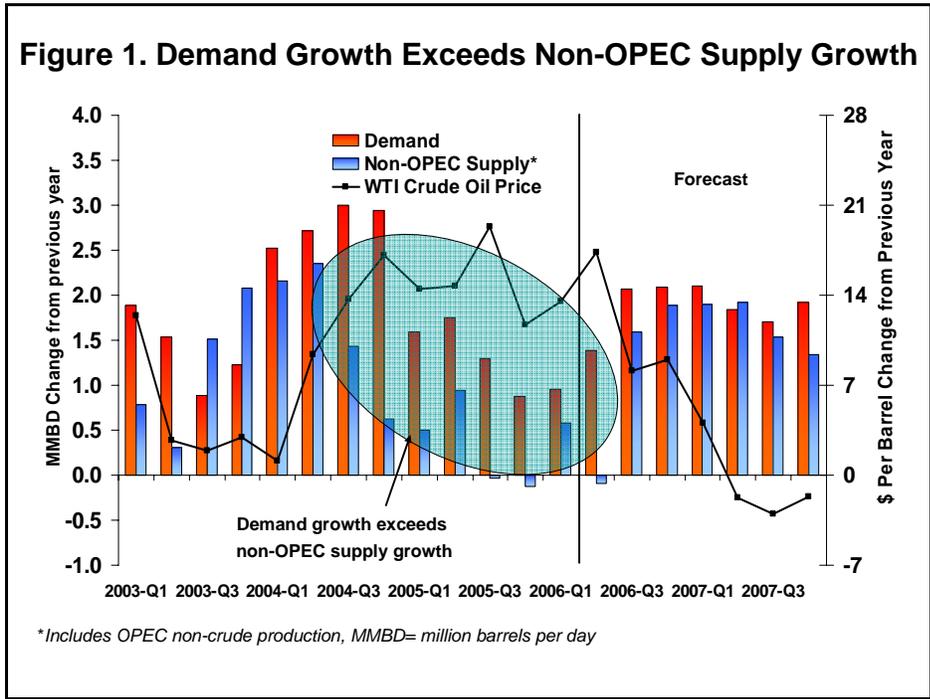


STEO Supplement: Why are oil prices so high?

During most of the 1990s, the West Texas Intermediate (WTI) crude oil price averaged close to \$20 per barrel, before plunging to almost \$10 per barrel in late 1998 as a result of the Asian financial crisis slowing demand growth while extra supply from Iraq was entering the market for the first time since the Gulf War. Subsequently, as Organization of Petroleum Exporting Countries (OPEC) producers more closely adhered to a coordinated production quota and reduced output, crude oil prices not only recovered, but increased to about \$30 per barrel as demand grew as Asian economies recovered. The most recent increase in crude oil prices began in 2004, when they almost doubled from 2003 levels, rising from about \$30 per barrel at the end of 2003 to peak at \$56.37 on October 26, 2004. After falling back briefly, prices then continued to rise in 2005 and 2006. In 2006, during much of May, June and July, WTI prices have averaged above \$70 per barrel. Adjusting for inflation, crude oil prices have not been this high since late 1982. This supplement discusses the main factors contributing to high crude oil prices.

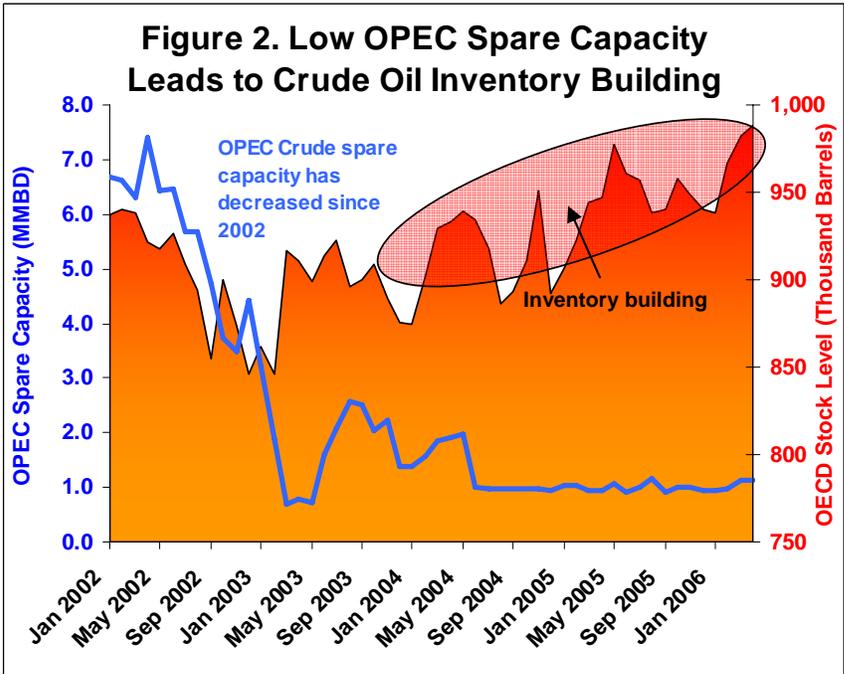
- 1) Demand growth continues to outstrip non-OPEC supply growth.** Increases in global oil production capacity are struggling to keep pace with rapidly growing demand, particularly in China, the other emerging economies in Asia, and the United States. China alone accounted for one-third of the demand growth in the world from 2003 to 2005, and this trend is expected to continue during 2006. Despite oil price increases in recent months, oil demand growth in major consumer countries has not slowed down as much as many expected, as consumers have adjusted to higher oil prices. Annual demand growth in 2004 was 2.7 million barrels per day (bbl/d), well over the previous five-year average. Even as prices continued to rise in 2005, annual demand growth totalled 1.4 million bbl/d. Oil demand continues to grow in response to continued worldwide economic growth, particularly in China and the United States.
- 2) Non-OPEC supply has failed to meet expectations.** Slower non-OPEC production growth relative to demand growth has raised crude oil production expectations from OPEC countries and has therefore lowered surplus production capacity (see Figure 1). The largest detriment to non-OPEC supply growth in the last year has been Hurricanes Katrina and Rita. From June 2005 to June 2006, hurricanes in the Gulf of Mexico cut an average of 450,000 bbl/d of Federal offshore Gulf of Mexico production from the world oil market in addition to damaging key refinery infrastructure. Most recently, EIA estimates that production losses from the Prudhoe Bay field due to pipeline problems will remove as much as 400,000 bbl/d from the market over the next several months. In the rest of the world, pronounced declines in the North Sea and non-OPEC Middle Eastern countries, delays in project start times, and unplanned field maintenance muted the small growth in non-OPEC supply during 2005 and the first half of 2006. Russian production was one of the major drivers of non-OPEC supply growth during the early 2000s. As the investment climate worsened and oil prices continued to rise, the government raised export and extraction taxes, adversely impacting production growth .

Figure 1. Demand Growth Exceeds Non-OPEC Supply Growth



Source: *Short Term Energy Outlook*. August 2006

3) **Low OPEC spare capacity levels increase the demand for inventories.** EIA currently estimates that global surplus crude oil production is about 1.0-1.3 million bbl/d, down from 5.6 million bbl/d as recently as 2002 (See Figure 2). The reduced level of spare production capacity significantly increases the risk to oil prices from a disruption to supply because as many as 20 different countries currently produce at least 1 million barrels per day, including countries such as Iran, Iraq, Nigeria, and Venezuela.



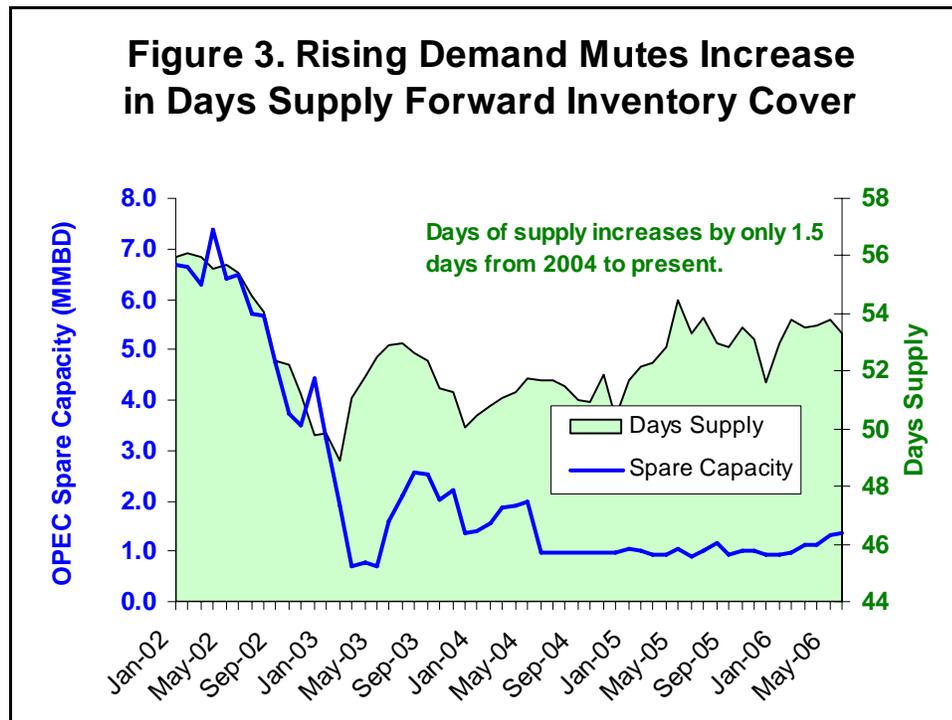
Source: *Short Term Energy Outlook*. August 2006

With low spare capacity, market participants can no longer rely on increased production from key members of OPEC to fully offset any supply disruptions and restore balance to

the market without the need for significant price changes, as they did in the 1990s and the first few years of this decade. Since OPEC production capacity was forced to increase as demand grew, OPEC spare capacity levels have been reduced even further. Industry recognizes the need for new capacity investments, but those additions are costly and sometimes come with a significant time lag.

In the present environment, with a minimal cushion of surplus upstream and downstream capacity to meet disruptions in supply and with futures markets in contango (i.e., a market in which prices for commodities delivered in future months are higher than for those delivered in months closer to the present), market participants have a strong demand for inventories, so the traditional inverse relationship between inventory and price levels does not apply.

In Figure 3, low OPEC spare capacity levels are due mainly to demand growing faster than production capacity, and crude oil inventory building has attempted to cushion against the risk of further problems. Still, keeping in mind that between 2003 and 2005 world oil demand increased by 4.1 million bbl/d, as the inventory cushion grew, it resulted in only 2 more days of forward cover.



Source: *Short Term Energy Outlook*, August 2006

- 4) **Geopolitical issues in major OPEC producing countries have lowered production and increased the risk of future production disruptions.** In a market with tight spare capacity and low forward cover in terms of days of supply, further risks introduced by geopolitical instability in many OPEC, as well as non-OPEC countries put additional upward pressure on crude oil prices. OPEC's production has been primarily hurt due to geopolitical instability in Iraq, Nigeria, Venezuela and Iran.

Iraq. Iraq is currently producing about 2.1 million barrels per day of crude oil, and total liquids production of about the same amount. Over the past two years,

monthly Iraqi production has varied from a low of 1.6 million barrels per day to a high of 2.3 million barrels per day, shifting largely as a result of security issues/damage to infrastructure as well as weather conditions at Iraqi ports. Last month, conditions improved to allow Iraq to export roughly 100,000 bbl/d via the Kirkuk-Ceyhan pipeline. But in recent weeks the security situation in the north has worsened, cancelling further exports through that pipeline.

Nigeria. Nigeria is the largest oil producer in Africa, with first half 2006 total liquids output of approximately 2.5 million bbl/d, of which, 2.2 million bbl/d is crude output. According to Shell around 500,000 bbl/d of its company's production is currently shut-in as a result of militant action. Further disruptions in late July have brought the total shut in volume to roughly 650,000 bbl/d. This disruption has affected the Atlantic basin market since Nigeria traditionally exports about 1.5 million bbl/d to the United States. Although new oilfields have come online in the last six months, the crude quality is not as light and sweet as the shut-in oil.

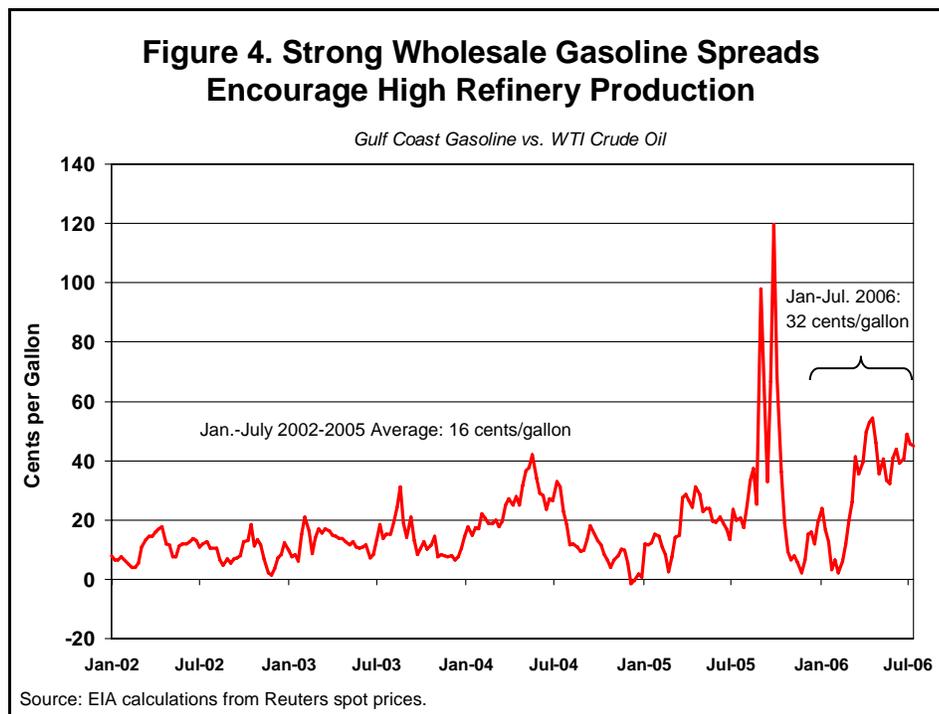
Venezuela. Venezuela's current crude oil production is about 2.5 million barrels per day, with total liquids production of about 2.8 million barrels per day. Venezuela's crude oil production since the strike of 2002-2003 has never returned to pre-strike levels. Crude oil production averaged 3.0 million barrels per day in 2001, and that was before the full development of the four, foreign-operated ultra-heavy oil upgrading projects that now produce 570,000 barrels per day. EIA estimates that (Venezuelan state oil company) PdVSA-operated capacity has fallen by 50 percent since the late 1990s, to about 1.4 million barrels per day at present.

Iran. Iran, unlike Saudi Arabia, does not have any surplus production capacity that could be brought online, i.e., the country is producing at the maximum rate possible. Iran's existing oilfields have a natural decline rate estimated at 8-13 percent per year (300,000-500,000 bbl/d). Current investment levels are insufficient to maintain, let alone expand, Iran's production. In addition, the uncertainty associated with the Iranian nuclear situation contributes to current and projected high oil prices

- 5) **Worldwide refining sector bottlenecks have raised refiner margins and have implications for crude oil prices.** Excess capacity in the refining industry, like that for crude oil production, has been shrinking as demand has grown and has left less of a buffer for emergencies or for periods when the supply and demand balance becomes unusually tight. The 2005 hurricanes further emphasized the importance of the refining sector. In the United States, refinery utilization is currently 92-93 percent of capacity, up from 85 percent in 2002, but the reduction in excess refining capacity is not just a U.S. issue.

Growing downstream tightness, especially in light, clean products for transportation, has increased pressure on product prices beyond the effects of rising crude oil costs. As a

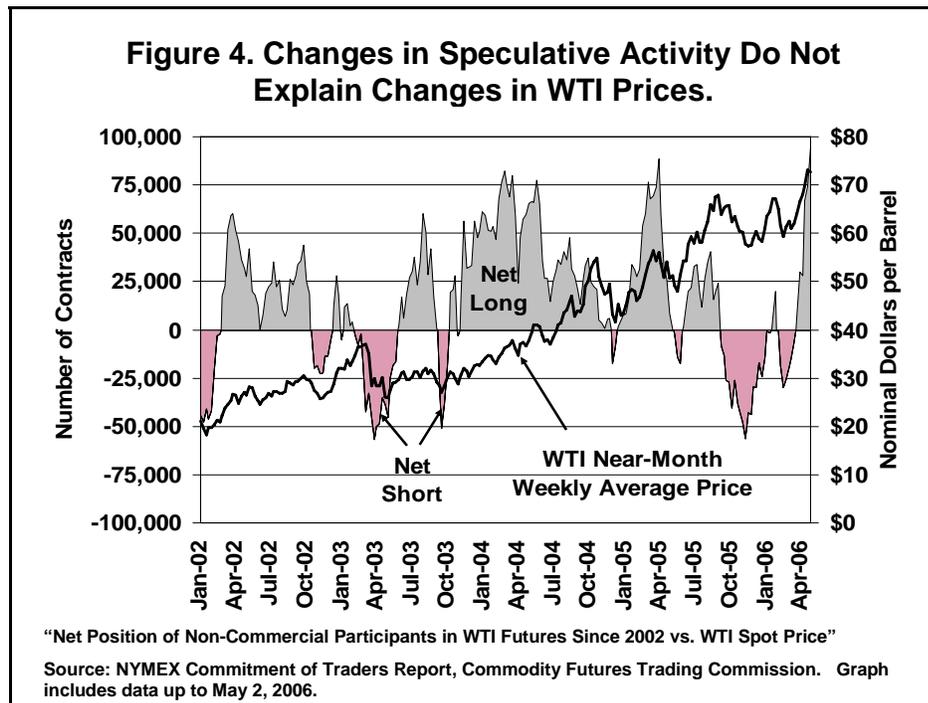
result, January-July 2006 US wholesale gasoline spreads¹ are twice as high as the January-July average for 2002-2005 (see Figure 4). In turn, the increase in refined product spreads has generated increased demand for crude oil, thereby lending added support to crude prices.



- 6) **Weather has disrupted supplies.** As discussed briefly above, last year's oil supply disruption in the Gulf of Mexico severely hurt the prospects for non-OPEC supply growth and had both short and long-term impacts on the WTI price. The Gulf of Mexico region is an important source for U.S. production of crude oil and natural gas. In 2004, crude oil production from the Federally-administered Outer Continental Shelf (OCS) fields was about 27 percent of total U.S. production. Texas, Louisiana, Alabama, and Mississippi also contribute significant onshore and State-administered offshore oil and natural gas production. Seasonal storm-related disruptions to oil and natural gas production are difficult to predict, primarily due to the uncertainty involved in predicting the location and intensity of future tropical cyclones. Severe storms that threaten the Gulf producing region do not happen every year, and long-lasting shut-in production resulting from storm damage is generally rare. Last year's hurricanes were an anomaly that destroyed existing fields, transportation infrastructure, and projects under construction. Many of these have only recently returned to operation or have been significantly delayed. The possibility of another disruption this summer is an always-present upward risk to EIA's price forecast.
- 7) **Available evidence suggests that increased speculative activity in oil markets is a symptom of, rather than a cause of, high oil prices.** EIA analysts believe that the change in the relationship between prices and Organization for Economic Cooperation

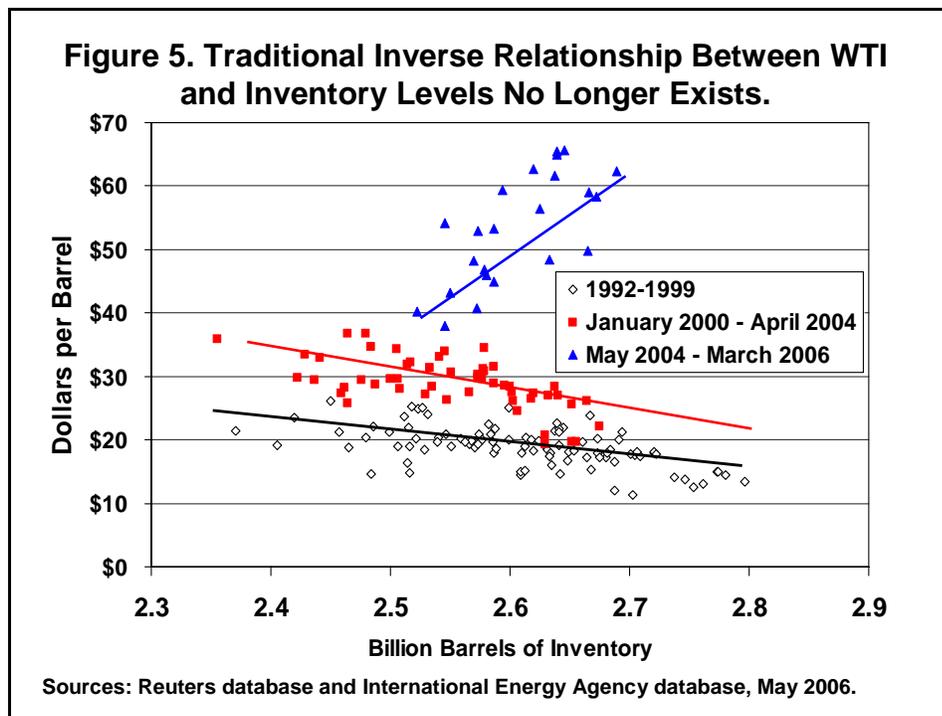
¹ The wholesale price spread is the difference between the wholesale price of gasoline and the spot price of crude oil.

and Development (OECD) commercial inventories is related to changes in the level of surplus production capacity, which declined sharply due to the acceleration of global oil consumption growth in 2003 and especially in 2004. Available evidence suggests that increases in speculative activity in futures markets are a result of the high level of current oil prices and the high uncertainty surrounding the value of future oil prices, not the other way around. In times of ample spare capacity there is little motivation for commercial producers and users of energy to shed risk, or hedge, since there is little perceived risk. With little desire to shed risk, there is only a small role for those who wish to take on the risk, the speculators. In contrast, when excess capacity declined and market participants perceived that OPEC members would no longer maintain stable prices in the environment of geopolitical risk, market participants became increasingly less certain of the path of future oil prices. The increased uncertainty regarding the path of future oil prices has caused commercial producers and users of energy to increase their desire to hedge. With the increased desire to shed risk, there has been a much larger role in the market for those prepared to bear this risk, the speculators. Although changes in the net position of non-commercial participants in WTI futures contracts appear to be in relation to changes in WTI spot prices in the very short run, the overall trend of increasing WTI spot prices is independent of the participation of speculators in the market.



EIA believes that the shift in the relationship between prices and OECD commercial inventories is better explained by changes in the level of surplus production capacity. OPEC’s change in behavior that came as a response to the Asian financial crisis and overproduction in the face of lower demand, shifted crude oil to a new price level. Production restraint by key OPEC member countries shifted the price base while market participants simultaneously perceived a growing likelihood or risk of increasingly scarce incremental crude oil supplies. Futures market long-term contracts shifted up to a new, higher, level of roughly \$30, reflecting these new long-term expectations. Still, inventory levels and crude oil spot prices continued their inverse relationship (i.e., falling inventories correlating with rising prices), as shown by the January 2000-April 2004

trend line in Figure 6. Beyond April 2004, there is an apparent reversal in the price/inventory relationship. While the correlation is not strong, prices appear to increase with increasing inventories, as shown by the May 2004 to March 2006 trend line in Figure 6. This fact alone appears confusing to some observers, who may attribute this shift to the activity of speculators.



Several different factors have caused the increase in crude oil prices since 2002. The disconnect between non-OPEC supply growth and rising demand growth has raised production expectations from OPEC suppliers at a time when geopolitical uncertainty inside of OPEC-member countries is at heightened levels. The increased upstream risk has combined with constraints in the downstream to hinder the smooth provision of available supply to demand centers. Weather anomalies have created an added risk to oil production in hurricane-prone regions, and the weak US dollar has masked the oil price rise in some regions that would otherwise have induced lower oil demand. The new role of speculative money in the market is more a function of a shift in the inventory and price relationship shown in Figure 6.

Given these factors, EIA does not foresee a relaxation of these trends through the short-term forecast period, as long as OPEC's spare capacity cushion remains at current levels. Although next year's oil supply balance may change with higher volumes of non-OPEC supply, these additions are still prone to project delays, cost overruns, and weather anomalies that have hurt production in the past.

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