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S. Hrg. 110–382

SPECULATION IN THE CRUDE OIL MARKET

JOINT HEARING

BEFORE THE

PERMANENT SUBCOMMITTEE ON INVESTIGATIONS

OF THE

COMMITTEE ON
HOMELAND SECURITY AND
GOVERNMENTAL AFFAIRS
UNITED STATES SENATE

AND THE

SUBCOMMITTEE ON ENERGY

OF THE

COMMITTEE ON ENERGY AND NATURAL
RESOURCES

ONE HUNDRED TENTH CONGRESS

FIRST SESSION

DECEMBER 11, 2007

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JEFF BINGAMAN and PETE V. DOMENICI are Ex Officio Members of the Subcommittee

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SPECULATION IN THE CRUDE OIL MARKET

TUESDAY, DECEMBER 11, 2007

U.S. SENATE,
PERMANENT SUBCOMMITTEE ON INVESTIGATIONS,
OF THE COMMITTEE ON HOMELAND SECURITY
AND GOVERNMENTAL AFFAIRS,
JOINT HEARING WITH THE SUBCOMMITTEE ON ENERGY,
COMMITTEE ON ENERGY AND NATURAL RESOURCES,
Washington, DC.

The Subcommittees met, pursuant to notice, at 10:03 a.m., in Room 216, Hart Senate Office Building, Hon. Carl Levin, Chairman of the Permanent Subcommittee on Investigations, Committee on Homeland Security and Governmental Affairs, and Hon. Byron L. Dorgan, Chairman of the Subcommittee on Energy, Committee on Energy and Natural Resources presiding.

Present: Senators Levin, McCaskill, Tester, Coleman, Collins, Dorgan, Wyden, Cantwell, Menendez, Bingaman, Salazar, Murkowski, Craig, Corker, and Barrasso.

OPENING STATEMENT OF SENATOR LEVIN

Senator LEVIN. Good morning, everybody. The Permanent Subcommittee on Investigations and the Subcommittee on Energy are conducting a joint hearing this morning into why U.S. oil prices keep rising despite what appears to be an adequate U.S. supply of oil.

The price of crude oil recently rose above $99 per barrel, a record high. Just before Thanksgiving, the national average price of gasoline went over $3.10 per gallon for the second time this year. The price of diesel fuel is at a record high, as is the price of home heating oil. These record high prices severely hurt millions of Americans and American businesses. They raise the cost of virtually everything in our daily lives—the gasoline in our cars and trucks, the food we eat, air travel, heating our homes and offices, generating electricity, and manufacturing countless industrial and consumer products. It is our duty in Congress to do everything that we can to ensure that the price Americans pay for energy is a fair price.

Just about a year ago, on January 18, 2007, the price of crude oil on the New York Mercantile Exchange (NYMEX), was about $50 per barrel. A few weeks ago, the NYMEX price reached an all-time high of just over $99 per barrel. The chart to my left, Exhibit 1, shows that huge increase in the price of oil.[1]

[1] See Exhibit No. 1, which appears in the Appendix on page 118.

And although the price of oil virtually doubled during this period, an unprecedented rise of nearly $50 in just 1 year, the overall inventory of oil in the United States has been above the 5-year average for the entire year. Exhibit 2 shows the way that inventory has remained above the 5-year average.[1] It just defies the laws of supply and demand to have an astronomical increase in the price of oil at the same time the U.S. inventory of oil has stayed above average.

On any given day, we can read in the newspapers or hear on the television the familiar explanations for why the price of oil is so high—instability in the Middle East, bad weather affecting oil production platforms, civil strife in oil-producing countries, the declining value of the dollar. These are just a few of the "usual suspects" that are often cited as the reasons for high prices.

The problem with these explanations is not that they are false. Most of them are true. But most of them have been true for some time. Unfortunately, instability in the Middle East is not new. There is always bad weather somewhere around the globe that affects oil production and transportation. There is, unfortunately, a lot of civil strife in a number of oil-producing countries. The dollar rises and the dollar falls. The world is a dangerous place. These factors alone cannot justify a doubling in the price of oil.

So what else can help explain these record prices? In this hearing, we will examine some of the other factors that are contributing to the high price of oil as well as what we can do about it.

One key factor that has contributed to the rise in oil prices over the past few years is the virtual explosion of trading of paper contracts for oil delivery in future months, trading which is speculative and not intended to result in the actual delivery of oil. Traders are trading paper oil contracts in record amounts. In the last 4 years, we have seen a huge increase in the number of oil futures contracts traded in the New York Mercantile Exchange, and there has also been tremendous growth of trading of U.S. crude oil in London. As Secretary of Energy Bodman recently said, the prices for crude oil are now set in New York, London, Tokyo, Singapore, and other trading hubs around the world.

Data compiled by the Commodity Futures Trading Commission (CFTC), shows that in the past few years, out of this overall increase in energy trading, the amount of trading due to speculation has nearly tripled. Chart 3—that is Exhibit 14[2] in the exhibit book—shows that in the last few years, the percentage of oil futures contracts held by speculators has risen from around 15 percent to nearly 45 percent. These are traders who are solely interested in trading for a profit rather than hedging their positions to assure a stable supply at a price that they can count on. These energy speculators not only comprise a larger percentage of U.S. oil trades, but are also responsible for a larger dollar amount involved in U.S. energy commodity trades.

A fair price is a price that reflects the forces of supply and demand for a commodity, not the trading strategies of speculators who are only in the market to make a profit by buying and selling

[1] See Exhibit No. 2, which appears in the Appendix on page 119.
[2] See Exhibit No. 14, which appears in the Appendix on page 201.

of paper contracts with no intent to actually purchase, deliver, or transfer the commodity. But as we have all too often seen in recent years, when speculation grows so large that it has a major impact on the market, prices get distorted and stop reflecting true supply and demand.

Last year, our Subcommittee released a bipartisan report called "The Role of Market Speculation in Rising Oil and Gas Prices: A Need to Put the Cop Back on the Beat."[1] The report found that trading of futures contracts by speculators had increased the demand for oil futures, and this additional demand for contracts had contributed an additional $20 to the price of oil. At the time, the price of oil was about $70 per barrel, so speculation was a major contributor to what was then thought to be sky-high crude oil prices. Our report recommended additional market transparency and stronger market oversight to reduce the effects of increased speculation.

Given the hefty increases in speculation in the U.S. oil market, we need to know what the effect of all this speculation has been on U.S. oil prices. To what extent, for example, has dramatically increased speculation contributed to the extraordinary jump in prices that we have seen this year? Is speculation responsible for about $20 per barrel of oil or more? This is a vitally important question. If the extraordinary increase in oil prices is not based on actual supply and demand, then we need to figure out what role is being played by speculation and what steps can be taken to restore the market's focus on supply and demand.

Speculation is not, of course, the only reason for sky-high oil prices in 2007. One additional key reason that we want to examine is the policy of the Administration relative to adding oil to the Strategic Petroleum Reserve (SPR). One of today's witnesses, Dr. Philip Verleger, will present his analysis of how the Administration's program to fill the SPR with high-quality crude oil, known as sweet crude, has contributed to the recent price increases. He will tell us how the SPR fill program has helped deplete supplies of sweet crude normally used to fulfill crude oil futures contracts traded on the NYMEX and how those reduced supplies have, in turn, pushed up crude oil prices.

There is a third problem, as well, that the SPR fill program has exacerbated. The fact that the standard NYMEX futures contract that sets the benchmark price for U.S. crude oil requires a particular type of high-quality crude oil known as West Texas Intermediate (WTI), to be delivered at a particular location, which happens to be Cushing, Oklahoma. Because the price of the standard contract depends upon the supply of WTI, which again is but one type of sweet crude oil, the supply and demand conditions in Oklahoma have a disproportionate influence on the price of NYMEX futures contracts. Four years ago, I called for reform of this outdated feature of the standard NYMEX crude contract, but it has never been fixed and the problems caused by the standard contract have gotten worse.

[1] See Exhibit No. 9, which appears in the Appendix on page 130.

The next chart, which is Exhibit 4, shows that in 2007, the crude oil inventory in Cushing, Oklahoma, fell.[1] When that inventory crashed, it caused a big supply drop in Oklahoma, even though overall U.S. crude oil inventories remained above average. But because the Oklahoma supply fell, the benchmark price on the NYMEX jumped, since again the NYMEX price depends on the supply and demand for oil at Cushing, Oklahoma.

According to Dr. Verleger, it is only sweet crude oil that now is in relatively short supply compared to demand, and that is part of the reason why oil on the NYMEX has become so expensive. Indeed, last month, the difference in price between sweet crude oil and some other types of crude oils reached $20, $30, or even $40 per barrel in U.S. trading. That is a pretty striking price gap.

Why does it matter that the Administration is depositing sweet crude into the SPR? It matters because the price of one key type of sweet crude, WTI, determines the price of the standard NYMEX contract. The standard NYMEX contract price, in turn, is a major influence on the price of fuels refined from crude oil, such as gasoline, heating oil, and diesel. That means when the WTI price is no longer representative of the price of U.S. crude oil in general, the prices of all these other commodities are also thrown out of whack.

And the Department of Energy has made the situation much worse by purchasing several million barrels of sweet crude and depositing them into the SPR over the past few months. Those purchases removed sweet crude from the marketplace and reduced the supply of oil available for WTI contracts. And as you can see from this chart,[1] the drop of several million barrels in the inventory of crude oil at Cushing since August has been accompanied by a huge increase in the price of U.S. crude oil. It seems that the only place in the United States where price really reflects supply and demand is in Cushing, Oklahoma.

In the last 4 months, DOE has taken several million barrels of sweet crude off the market to fill the SPR, regardless of price. If DOE had simply postponed the SPR fill for 1 year, it would not only have alleviated the upward pressure on U.S. oil prices, but also saved U.S. taxpayers millions of dollars. Based on the market and futures prices at the time the DOE bought oil for the SPR, DOE could have saved $10 per barrel by simply locking in the futures price and deferring current deliveries for 1 year. That is because at the time the oil was acquired, the futures price for delivering the oil in 1 year was about $10 per barrel cheaper than the current price. Since the Administration bought enough oil to deposit another 8.7 million barrels in the SPR, that $10 million price difference would have translated into a 1-year taxpayer savings of nearly $87 million.

In light of Congress's direction in the Energy Policy Act of 2005 to fill the SPR in a manner that minimizes costs to taxpayers and minimizes impacts on oil prices, it is incomprehensible why DOE continues to fill the SPR without taking advantage of the lower futures prices when they exist.

This state of affairs raises two questions. First, why is DOE contributing to the shortage of sweet crude oil by placing it into the

[1] See Exhibit No. 4, which appears in the Appendix on page 121.

SPR and thereby helping boost the standard NYMEX price? What's worse, it is our understanding that the DOE intends to deposit another 7 million barrels of sweet crude oil into the SPR beginning next month. DOE will be taking this high-quality oil off the market just at the time when it will be in the highest demand to produce gasoline and diesel fuel for the spring and summer driving seasons.

Second, it appears that we have an oil futures market that reflects the supply and demand conditions in Oklahoma, but not necessarily the overall supply and demand situation in the United States as a whole. Our Subcommittee raised this very issue in 2003 and called on the CFTC and NYMEX to work together to revise the standard NYMEX crude oil futures contract to reduce its susceptibility to local imbalances in the market for WTI crude oil. The Subcommittee report suggested that allowing for delivery at other locations could reduce the volatility of the contract. It is truly disappointing that since our report was issued, no progress has been made in allowing for delivery in other places than Cushing. Again, the price of oil to our consumers is higher because of that failure.

The final problem is that a large portion of trading of WTI crude oil now takes place in London, regulated by the British authorities under British law. How can we really know what is influencing our oil markets when we can't see all the market data? Although the CFTC has a data sharing agreement with the British authorities, none of this data is available to the public. Unlike the U.S. oil futures market, there is no public data on how much of the trading occurring in London is done by speculators. So a key issue is how can we improve the transparency of the crude oil market?

In addition to stopping the SPR fill, fixing the NYMEX contract, and getting information about WTI trades in London, a number of us have introduced the Close the Enron Loophole Act to improve the transparency of U.S. energy markets. Our bill would give the CFTC the authority to police what are now unregulated electronic trading markets for large energy traders. This vitally needed legislation is more important right now for natural gas prices, but there is nothing preventing crude oil contracts from being traded on unregulated electronic markets, as well, and which took place until recently. Many of us are working together to pass this legislation as part of the farm bill.

All of our witnesses today are very knowledgeable about the oil markets. I thank all of them for their willingness to testify at this joint hearing and we all look forward to their testimony.

I would also like to express particularly my appreciation to the Ranking Member of the Permanent Subcommittee, Senator Coleman, and his staff for their support in organizing this hearing, and to our colleagues on the Senate Energy Committee for working together with us to conduct this joint hearing. In particular, I want to thank Senators Dorgan and Murkowski of the Subcommittee on Energy for all of their efforts. The price of oil is an important issue for all of us and our constituents, as it affects virtually every aspect of our economy. I am glad that we have worked together so closely so that we can focus our witnesses and our attention in a single forum where this issue can be examined.

[The prepared statement of Senator Levin follows:]

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Good morning. The Permanent Subcommittee on Investigations and the Subcommittee on Energy are conducting a joint hearing into why U.S. oil prices keep rising despite what appears to be an adequate U.S. supply of oil.

The price of crude oil recently rose above $99 per barrel, a record high. Just before Thanksgiving, the national average price of gasoline went over $3.10 per gallon for the second time this year. The price of diesel fuel is at a record high, as is the price of home heating oil. These record high prices severely hurt millions of Americans and American businesses. They raise the cost of virtually everything in our daily lives—the gasoline in our cars and trucks, the food we eat, air travel, heating our homes and offices, generating electricity, and manufacturing countless industrial and consumer products. It is our duty in the Congress to do everything we can to ensure that the price Americans pay for energy is a fair price.

Just about a year ago, on January 18, the price of crude oil on the New York Mercantile Exchange (NYMEX) was about $50 per barrel. A few weeks ago, the NYMEX price reached an all-time high of just over $99 per barrel. [Exhibit 1] Although the price of oil virtually doubled during this period—an unprecedented rise of nearly $50 in just one year—the overall inventory of oil in the United States has been above the 5-year average for the entire year. [Exhibit 2] It seemingly defies the laws of supply and demand to have an astronomical increase in the price of oil at the same time the U.S. inventory of oil has stayed above average.

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A fair price is a price that accurately reflects the forces of supply and demand for a commodity, not the trading strategies of speculators who only are in the market to make a profit for themselves by the buying and selling of paper contracts with no intent to actually purchase, deliver, or transfer the commodity. But as we have all too often seen in recent years, when speculation grows so large that it has a major impact on the market, prices get distorted and stop reflecting true supply and demand.

Last year, my Subcommittee released a bipartisan report, *"The Role of Market Speculation in Rising Oil and Gas Prices: A Need to Put the Cop Back on the Beat."* The report found that trading of futures contracts by speculators had increased the demand for oil futures, and this additional demand for contracts had contributed an additional $20 to the price of oil. At the time the price of oil was around $70 per barrel, so speculation was a major contributor to what was then thought to be sky-

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According to Dr. Verleger, it is only sweet crude oil that now is in relatively short supply compared to demand, and that is part of the reason why oil traded on the NYMEX has become so expensive. Indeed, last month, the difference in price between sweet crude oil and some other types of crude oils reached $20, $30, even $40 per barrel in U.S. trading. That's a striking price gap.

Why does it matter that the Administration is depositing sweet crude into the SPR? It matters because the price of one key type of sweet crude, WTI, determines the price of the standard NYMEX contract. The standard NYMEX contract price, in turn, has a major influence on the price of fuels refined from crude oil such as gasoline, heating oil, and diesel. That means when the WTI price is no longer representative of the price of U.S. crude oil in general, the prices of all of these other commodities are also thrown out of whack.

And DOE has made the situation much worse by purchasing several million of barrels of sweet crude and depositing them into the SPR over the past few months. Those purchases remove sweet crude from the marketplace and reduce the supply of oil available for WTI contracts. As you can see from the chart, the drop of several million barrels in the inventory of crude oil at Cushing since August has been accompanied by a huge increase in the price of U.S. crude oil. [Chart 4]. It seems that the only place in the United States where price really reflects supply and demand is in Cushing, Oklahoma.

In the last four months, DOE has taken several million barrels of sweet crude off the market to fill the SPR, regardless of price. If DOE had simply postponed the SPR fill for one year, it would have not only alleviated the upward pressure on U.S. oil prices, but also saved U.S. taxpayers millions of dollars. Based on the market and futures prices at the time the DOE bought oil for the SPR, for example, DOE could have saved $10 per barrel by simply locking in the futures price and deferring current deliveries for one year. That's because at the time the oil was acquired, the futures price for delivering the oil in one year was about $10 per barrel cheaper than the current price. Since the Administration bought enough oil to deposit another 8.7 million barrels in the SPR, that $10 price difference would have translated into a one-year taxpayer savings of nearly $87 million. In light of Congress's direction in the Energy Policy Act of 2005 to fill the SPR in a manner that minimizes

costs to taxpayers and minimizes impacts on oil prices, it is incomprehensible why DOE continues to fill the SPR without taking advantage of the lower futures prices.

This state of affairs raises two questions. First, why is DOE contributing to the shortage of sweet crude oil by placing it into the SPR, and thereby helping boost the standard NYMEX price? What's worse, it is our understanding that DOE intends to deposit another 7 million barrels of sweet crude oil into the SPR beginning next month. DOE will be taking this high-quality oil off the market just at the time when it will in the highest demand to produce gasoline and diesel fuel for the spring and summer driving seasons.

Second, it appears that we have an oil futures market that reflects the supply and demand conditions in Oklahoma, but not necessarily the overall supply and demand situation in the United States as a whole. Our Subcommittee raised this very issue in 2003, and called on the CFTC and NYMEX to work together to revise the standard NYMEX crude oil futures contract to reduce its susceptibility to local imbalances in the market for WTI crude oil. The Subcommittee report suggested that allowing for delivery at other locations could reduce the volatility of the contract. It is truly disappointing that since our report was issued no progress has been made in allowing for delivery in other places than Cushing. Again, the price of oil to our consumers is higher because of that failure.

A final problem is that a large portion of trading of WTI crude oil now takes place in London, regulated by the British authorities under British law. How can we really know what is influencing our oil markets when we can't see all of the market data? Although the CFTC has a data-sharing agreement with the British authorities, none of this data is available to the public. Unlike the U.S. oil futures market, there is no public data on how much of the trading occurring in London is done by speculators. So a key issue is how can we improve the transparency of the crude oil market?

In addition to stopping the SPR fill, fixing the NYMEX contract, and getting information about WTI trades in London, a number of us have introduced the "Close the Enron Loophole Act" to improve the transparency of U.S. energy markets Our bill would give the CFTC the authority to police what are now unregulated electronic trading markets for large energy traders. This vitally needed legislation is more important right now for natural gas prices, but there is nothing preventing crude oil contracts from being traded on unregulated electronic markets as well, and which took place until recently. Many of us are working together to pass this legislation as part of the Farm Bill.

All of our witnesses today are very knowledgeable about the oil markets. I thank all of them for their willingness to testify at this joint hearing. I look forward to their testimony.

I would also like to express my appreciation to the Ranking Member of the Permanent Subcommittee, Senator Coleman, and his staff, for their support in organizing this hearing, and to our colleagues on the Senate Energy Committee for working together with us to conduct this joint hearing. I want to particularly thank Senators Dorgan and Murkowski of the Subcommittee on Energy for their efforts. The price of oil is an important issue for all of us and our constituents, as it affects virtually every aspect of our economy. I am glad that we have been able to work together so we can focus our witnesses and our attention in a single forum where this issue can be examined.

Senator LEVIN. Senator Dorgan.

OPENING STATEMENT OF SENATOR DORGAN

Senator DORGAN. Mr. Chairman, thank you very much. We were intending to hold a hearing in our Subcommittee this very week with some of the same witnesses, and when we saw that you were holding this hearing, we suggested that it be joint. I very much appreciate your cooperation. I think this is a very important hearing.

The Close the Enron Loophole Bill is essential. I chaired the hearings in the Commerce Committee where Ken Lay came and took the Fifth Amendment. I chaired a good number of hearings on Enron in that Commerce Subcommittee and know a fair amount about what happened back then. No one is suggesting there is an equivalent set of actions here. We now know that what happened with respect to the Enron loophole is that markets were manipu-

lated. Billions of dollars were extracted from the pockets of the victims, that is the consumers, particularly on the West Coast. We know that it was criminal activity and a criminal enterprise now. But we know that much of that was able to take place outside of the view of regulators.

This question of the price of oil on the futures market raises the same sort of issues, and long past the time when we discovered Enron was a criminal enterprise, we have not yet closed the Enron loophole that allowed all that activity to take place outside of the view of regulators. I am proud to be a cosponsor, Mr. Chairman, of that legislation.

There is not a free market in oil. With the substantial blockbuster mergers in the oil industry, the companies have more power and more muscle in the marketplace. The OPEC nations control 40 percent of the world's oil supply, including the faucet that feeds much of our oil addiction. Ninety percent of the oil is controlled by companies that are at least partially or wholly state-owned, and, of course, that moves them away from some of the market principles. And finally, the commodities futures market, in my judgment, has become an orgy of financial speculation, a carnival of greed almost, and I believe it is substantially increasing the market price for a barrel of oil.

I used to teach a little economics, and some might hear that statement and say, well, it must have been very little, but I will say this. There are some, I think, thoughtful economists who take a look at what is happening in the futures market and say that this has become an unbelievable amount of speculative activity that is driving up the price of oil, having very little to do with supply and demand.

There is so much money sloshing around in these markets these days. Hedge funds are up hip deep into these markets. Investment banks are also into these markets. I don't know because I haven't investigated it, but I have read investigative reports that investment banks in some cases are even constructing storage facilities in order to store oil, keep it off the market, anticipating the market price will increase. That means you reduce supply, and as you reduce supply, drive up price and hold oil for profits later. These are people that don't want to buy any oil. They don't want to ever own any oil except on paper, but they want to be in the futures market to be speculators and make a lot of money.

Now, Mr. Chairman, if I might show Exhibit No. 18[1] first, your Subcommittee did some extraordinary work in detailing the Amaranth issue. A 32-year-old energy trader helped to lead to the collapse of an $8 billion hedge fund. This is in natural gas. You all did this. It was interesting to me, why is it that you were able to dig this out and the referees, the people that are supposed to wear the striped shirts, the people that are paid on the public payroll, didn't know this. Why is it that the regulators couldn't see this? It is because we have a system in which they are prevented from knowing what happens on the unregulated exchanges.

[1] See Exhibit No. 18, which appears in the Appendix on page 205.

And so if I might see Exhibit No. 16,[1] after I read about Amaranth and the work that you had done on this Subcommittee, which seems to me to just be "case closed" in terms of should we do something, CNNMoney.com had this on it. It said, "It has been rumored that Goldman Sachs has over $80 billion in the market. Its influence is so big traders refer to the day of the month when the bank sells the current month contract and buys the future month as the 'Goldman roll' due to its effect on price." Once again, the notion of big investment banks being involved in this speculative market.

That is a change. That is new. And it dramatically affects the market in a way that is not related to ordinary supply and demand relationships. So something is wrong.

I support the marketplace. I think it is a wonderful thing. When it works well, it is the best allocator of goods and service. And you must have a futures market for liquidity and so on. But it seems to me that the case has been made that we have a circumstance now where there is no shortage of oil. We can make a case that, yes, China is going to have 100 million additional cars on the road in 15 years and has demand. You can make lots of cases that we are going to be short of oil in the future. I understand that.

But look at the fundamentals now and evaluate. Are we short of oil? What would cause these prices to move up and bob around at $90 and $100 a barrel? The cause, in my judgment, is unbelievable speculation and unregulated over-the-counter markets that leaves this country and the markets open to market manipulation of oil prices.

We need to give the CFTC the broader ability to prevent fraud, manipulation, excessive speculation in these commodity markets, and a good start in doing that is the Close the Enron Loophole bill. If there is a legal loophole that can be exploited, our experience having served in Congress and watching this is it will be exploited. When we see it being exploited, we have a responsibility to change it.

If price increases in oil are due to supply and demand imbalances, then economic policies can be developed to encourage investments in new energy sources and conservation. If price increases are due to geopolitical factors in producer countries, then you develop foreign policies to try to respond to that. If price increases are due to hurricane damage that damage investments, then you can develop other kinds of approaches in Congress to respond to that. But to the extent that energy prices are the result of excessive speculation, only a cop on the beat, only an effective regulator with the tools to regulate, with both oversight and enforcement authority, is going to solve this problem.

So, Mr. Chairman, I thank you. I am pleased to join you. And once again, I see no justification in the marketplace for oil prices to reach $100 a barrel. I think there is a carnival of speculation out there that is unhealthy for this country and this Congress has a responsibility to give regulators the tools they need.

Senator LEVIN. Thank you so much, Senator Dorgan. Senator Coleman.

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[1] See Exhibit No. 16, which appears in the Appendix on page 203.

OPENING STATEMENT OF SENATOR COLEMAN

Senator COLEMAN. Thank you, Mr. Chairman. Over the past 5 years, the Permanent Subcommittee on Investigations has conducted a number of investigations into volatility and price increases in essential U.S. energy commodities, including natural gas, gasoline, and crude oil. These investigations have examined not only the role of market speculation in rising energy prices, but also the adequacy of government oversight in the markets that set these prices.

Today's hearing, which focuses on the impact of market speculation on crude oil prices, continues the Subcommittee's bipartisan effort to ensure the integrity of U.S. energy prices. As always, I would like to thank Chairman Levin and his staff for their hard work on these issues.

Americans are upset because they are paying more for oil than ever before, and a lot of people are concerned that speculation is behind the record price surge. Today's hearing is an important step in addressing these concerns and an important reminder that high energy prices affect all Americans.

Over the past several years, U.S. oil and gas markets have experienced unprecedented volatility and significant price increases. Since 2000, the price of crude oil has jumped from a range of $25 to $30 per barrel to over $90 per barrel. And since last year alone, crude oil prices have increased by $20 to $30 per barrel, often approaching a staggering $100 per barrel.

Record high crude oil prices have affected everything from home heating bills to holiday travel, and American families and small businesses are feeling the squeeze. Today, the cost of gasoline at the pump hovers around $3 a gallon. Diesel fuel, which is often used by trucking companies and delivery services, remains even higher. And of particular concern back home in Minnesota, the cost of heating oil continues to rise.

As a Senator from the Midwest, I know all too well that heating bills will place millions of Americans in financial jeopardy this winter. I will never forget the testimony I heard during the Subcommittee's field hearing in St. Paul last year. Too many Americans find themselves in similar circumstances to Deidre Jackson and Lucille Olsen, who testified about the burdens caused by rising energy costs. In the case of Ms. Olsen, her home heating bill represented 30 percent of her monthly income. As a senior citizen trying to cope with the high cost of health insurance and prescription drugs, last year's spikes in energy prices made it difficult for her to make ends meet. Ms. Jackson, a working mother of three and a college student, shared with me the financial jeopardy she faced as a result of a home heating bill that increased by more than 100 percent.

As crude oil prices have soared to record levels, Ms. Jackson's and Ms. Olsen's testimony provided powerful reminders of the real world impacts of high energy prices. In the short term, this situation means there is a lot of hardship for a lot of folks who can't afford double-digit heating increases, and I have got to tell you, in Minnesota, where I have already been shoveling snow—it was minus-9 in St. Paul not too long ago, and I think minus-27 in Northern Minnesota—there is going to be a great impact. So it is

important that Congress consider the factors that have contributed to the record price run-up.

The Department of Energy has announced larger than expected stockpiles of both crude oil and gasoline, and most experts agree that there is no overall shortage of U.S. crude. Nevertheless, oil prices remain at near record highs, suggesting that forces other than supply and demand may have contributed to these increases.

People are concerned that speculative trading is the reason for the unprecedented price surge for crude oil. We have called today's hearing to specifically address these concerns.

A number of Subcommittee investigations have focused on the troubling level of high-risk speculative trading that occurs on U.S. energy markets, much of it on unregulated over-the-counter energy exchanges exempted from government oversight. Financial institutions, pension funds, hedge funds, and other speculative investors have deployed tens of billions of dollars in speculative capital to U.S. crude oil markets. These traders bring important liquidity and vitality to our energy markets, but they should not be allowed to overwhelm the real buyers and sellers of crude oil, including utilities and industrial users. For this reason, it is imperative that Congress provide regulators with the statutory authority and budget necessary to police our energy markets and ensure the integrity of our energy prices.

That said, it is still hard to pin the run-up on crude oil on speculation run amok. The markets still appear to respond to supply and demand fundamentals. Last year, as Chairman Levin noted, our report highlighted the impact of speculation on the price of oil and gas. Again, though, as we look at it in terms of responding to fundamentals, it appears that the long-term underlying trend for crude oil is that demand is increasing while supply remains tight. Geopolitical instability, including uncertain situations in Iraq and Iran, have created fears of potential supply disruption and a substantial risk premium has been built into current prices.

Beyond those temporary concerns, global demand for crude oil fueled by China and India's development continues to increase, leaving many investors worried that global supplies cannot keep pace with demand. Add to these concerns the fact that our refining capacity cannot satisfy projected demand, and it becomes clear that there is more behind high crude oil prices than just market speculation.

Oil prices are at record highs because the United States and the rest of the world are consuming oil at unprecedented levels. It is a matter of when, not if, global supplies will be unable to meet our demand. And we here in Congress cannot forget that we are part of the problem.

The Chairman noted and went through with great detail the impact on cost of putting sweet crude oil into the strategic reserve. I intend to question the witnesses about this. There are concerns about whether there are environmental regulations that impact this. But clearly, that is from a micro perspective part of the problem.

We also have to look at the macro. We have not taken the necessary steps to reduce our dependence on foreign oil. More than ever before, it is imperative that we explore alternative sources of

energy. At the same time, the U.S. Congress must work to ensure the integrity of U.S. energy markets by providing regulators, as I said before, with the statutory authority and resources necessary to do their job. As we do so, we must protect competition and avoid unintended consequences, namely creating incentives for investors to move to less-transparent energy markets, including those offshore.

Just one last comment on this, kind of the macro issue. As we deal with the cost of oil today, one of the things that I can't forget is that in the early 1970s, this country went through a run-up in the cost of gasoline, went through long lines, and for a moment it appeared that we would do something about it. Brazil went through the same thing. In 1970, they embarked on a course of ending their country's dependence on foreign oil and what happened is despite then the rises and falls in the price of gas and a barrel of oil, Brazil stayed on course and today is in a situation where they don't have to import foreign oil. It is hard to buy a car in Brazil that is not a flex-fuel engine.

In this country, unfortunately, as prices dropped, it pulled the market out of a lot of alternative sources of energy, and 30 years later, we find ourselves still kind of at the starting gate. I think whatever we do here, that we have to take a long-term perspective and understand that we have to end dependence on foreign oil.

So I hope as we address the situation this winter, that we are looking five, ten winters ahead so that the generation after me doesn't come up to the plate and find themselves in the same situation.

Again, I would like to thank Chairman Levin for initiating today's bipartisan hearing. I would like to thank today's witnesses for their testimony on these important issues. Thank you, Mr. Chairman.

[The prepared statement of Senator Coleman follows:]

OPENING STATEMENT OF SENATOR NORM COLEMAN

Over the past five years, the Permanent Subcommittee on Investigations has conducted a number of investigations into volatility and price increases in essential U.S. energy commodities, including natural gas, gasoline, and crude oil. These investigations have examined not only the role of market speculation in rising energy prices, but also the adequacy of government oversight in the markets that set these prices. Today's hearing, which focuses on the impact of market speculation on crude oil prices, continues the Subcommittee's bipartisan effort to ensure the integrity of U.S. energy prices. As always, I would like to thank Chairman Levin and his staff for their hard work on these issues. Americans are upset that they are paying more for oil than ever before, and a lot of people are concerned that speculation is behind the record price surge. Today's hearing is an important step in addressing these concerns and an important reminder that high energy prices affect all Americans.

Over the past several years, U.S. oil and gas markets have experienced unprecedented volatility and significant price increases. Since 2000, the price of crude oil has jumped from a range of $25-$30 per barrel to over $90 per barrel. In the last year alone, crude oil prices have increased by a $20-$30 per barrel, often approaching a staggering $100 per barrel.

Record high crude oil prices have affected everything from home heating bills to holiday travel, and American families and small businesses are feeling the squeeze. Today, the cost of gasoline at the pump hovers around $3 a gallon. Diesel fuel, which is often used by trucking companies and delivery services, remains even higher. And of particular concern back home in Minnesota, the cost of heating oil continues to rise.

As a Senator from the Midwest, I know all to well that heating bills will place millions of Americans in financial jeopardy this winter. I will never forget the testi-

mony I heard during the Subcommittee's field hearing in St. Paul last year. Too many Americans find themselves in circumstances similar to Deidre Jackson and Lucille Olson, who testified about the burdens caused by rising energy costs. In the case of Ms. Olson, her home heating bill represented 30 percent of her monthly income. As a senior citizen trying to cope with the high costs of health insurance and prescription drugs, last year's spikes in energy prices made it difficult for her to make ends meet. Ms. Jackson, a working mother of three and a college student, shared with me the financial jeopardy she faced as a result of a home heating bill that had increased by more than 100 percent. As crude oil prices soar to record levels, Ms. Jackson's and Ms Olson's testimony provided powerful reminders of the real-world impacts of high energy prices.

In the short-term, this situation means there is a lot of hardship for a lot of folks who can't afford double-digit heating cost increases. It is critical that Congress examine the factors that have contributed to the record price run-up. The Department of Energy has announced larger-than-expected stockpiles of both crude oil and gasoline, and most experts agree that there is no overall shortage of U.S. crude. Nevertheless, oil prices remain at near record highs, suggesting that forces other than supply and demand may have contributed to these increases.

People are concerned that speculative trading is the reason for the unprecedented price surge for crude oil. We have called today's hearing to specifically address these concerns. A number of Subcommittee investigations have focused on the troubling level of high-risk, speculative trading that occurs on U.S. energy markets—much of it on unregulated, over-the-counter energy exchanges, exempted from government oversight. Financial institutions, pension funds, hedge funds, and other speculative investors have deployed tens of billions of dollars in speculative capital to U.S. crude oil markets. These traders bring important liquidity and vitality to our energy markets, but they should not be allowed to overwhelm the real buyers and sellers of crude oil, including utilities and industrial users. For this reason, it is imperative that Congress provide regulators with the statutory authority and budget necessary to police our energy markets and ensure the integrity of our energy prices.

That said, it is still hard to pin the price run-up for crude oil on speculation run amuck. The markets still appear to be responding to supply and demand fundamentals. The long-term underlying trend for crude oil is that demand is increasing while supply remains tight. Geopolitical instability, including uncertain situations in Iraq and Iran, has created fears of potential supply disruptions, and a substantial "risk premium" has been built into current prices. Beyond those temporary concerns, global demand for crude oil, fueled by China and India's development, continues to increase, leaving many investors worried that global supplies cannot keep pace with demand. Add to these concerns the fact that our refining capacity cannot satisfy our projected demand and it becomes clear that more is behind high crude oil prices than market speculation.

Oil prices are at record highs because the U.S. and the rest of the world are consuming oil at unprecedented levels. It is a matter of when, not if, that global supplies will be unable to meet our demand. And we here in Congress cannot forget that we are part of the problem. We have not taken the necessary steps to reduce our dependence on foreign oil. More than ever before, it is imperative that we explore alternative sources of energy. Moreover, Congress must work to ensure the integrity of U.S. energy markets by providing regulators with the statutory authority and resources necessary to do their jobs. As we do so, however, we must protect competition and avoid unintended consequences—namely, creating incentives for investors to move to less transparent energy markets, including those offshore.

Again, I would like to thank Chairman Levin for initiating today's bipartisan hearing. I would like to thank today's witnesses for their testimony on these important issues.

Senator LEVIN. Thank you so much, Senator Coleman. Senator Murkowski.

OPENING STATEMENT OF SENATOR MURKOWSKI

Senator MURKOWSKI. Thank you, Mr. Chairman, and thank you to the panel here before us this morning. I appreciate your being here. I do believe that your testimony this morning will be very helpful to us as we seek to determine whether increasing demand, market speculation, or a combination of those and other factors

have led us to where we are today, with the price of crude oil approaching really an all-time high.

In looking at how oil is traded, it is also important to focus on the basic fundamentals of the market. In the global market, the price of oil is set by supply and demand conditions. Economics 101 teaches us that when demand is high and supply is low, the market will see an increase in price. So, therefore, even as we examine the possible role that speculation has played in the increase of crude oil prices, we must not lose sight of the fact that high oil prices are being driven by a lot of different factors out there. These include the increases in global oil demand, reduced supply, ongoing geopolitical concerns, and decreased refinery capacity. We all know that oil demand in China, for example, appears to be continuing its recent double-digit advances.

Since the beginning of this year, oil prices have increased by nearly 40 percent, and while this is very steep, it is not unprecedented. Over the past 10 years, crude oil prices have increased by approximately 370 percent. Much of this increase occurred in the absence of heavy trading and is broadly attributed to the increase in global demand.

According to the EIA, global demand for oil is projected to rise by 1.1 million barrels per day in 2007 and 1.5 million barrels per day in 2008. Total U.S. petroleum consumption is expected to increase by 0.5 percent in 2007 and 1 percent in 2008. This increase, which has brought the demand levels much closer to supply levels, can be connected to the economic growth of the United States and to colder winter temperatures, which will continue to boost the demand for our heating oil.

So with the high prices and the growing consumption, we have got to figure out ways that we can increase our domestic production. Currently, the OPEC countries continue to be the largest oil producing countries and hold the largest percent of oil reserves. Seventy-seven percent of the world's oil reserves are located outside of the United States. Since November 2007, OPEC's production has decreased by 1.2 million barrels per day, partially the result of political instability in Nigeria, Venezuela, and Iran. We know that events in these countries have directly contributed to and quite honestly become a constant factor in higher crude oil prices.

Also related to the topic of increasing supply is the need to increase our ability to refine the supply and to diversify the places where refining takes place. EIA has reported that the current domestic refinery capacity expansion plan estimates approximately one million barrels per day by 2012. This is the equivalent of five new refineries. Our domestic refining capacity is growing, but not as quickly as we would hope that it would.

So we need to find ways to increase capacity at existing refineries more quickly, and we also need to explore and promote ways to build new refineries in places outside of the Gulf of Mexico. We look back to Hurricane Katrina and certainly realize that that made us painfully aware that the lack of refining capacity in this country must be addressed. We have got to ensure that new refineries are built. If we don't address the need for more refinery capacity in the United States, our dependence on our imports for petroleum products will continue to increase, our record trade deficit

will grow even larger as we have to import more finished products, and the number of skilled jobs lost from the construction, operation, and maintenance of domestic refineries will increase.

So in spite of the increase in oil and petroleum costs, global oil markets will likely remain tight as world oil demands continue to grow. The best way to continue to address this issue is to increase domestic production, promote alternative fuels, and conserve greater amounts of energy, no great revelation there. Certainly as an Alaska Senator, I would be remiss if I didn't take an opportunity to urge that in this Nation as we look to increased domestic production that we look to the Arctic Coastal Plain. We also need to increase development in the Outer Continental Shelf and to increase oil shale production in the West.

I do appreciate the significance, the timing of this hearing this morning, the willingness to hold the hearing to examine crude oil speculation in greater detail, but I also view this as an opportunity to recognize that while speculation may contribute to high oil prices, it is just one piece in a much larger puzzle.

So again, Mr. Chairman, I appreciate you convening this joint hearing this morning and look forward to the testimony from all. Thank you.

[The prepared statement of Senator Murkowski follows:]

OPENING STATEMENT OF SENATOR LISA MURKOWSKI

Welcome. I want to thank our panel of witnesses for taking time out of their busy schedules to join us today. Your testimony will be invaluable as we seek to determine whether increasing demand, market speculation, or a combination of those and other factors have led the price of crude oil to approach its all-time high.

As oil prices approached the $100 per barrel mark, the media began to draw attention to financial energy market activity. Market analysts began to question whether supply and demand, coupled with geopolitical instability and a number of short-term incidents, were enough to drive crude prices as high as they are.

This prompted those of us in Congress, private industry, and consumers to begin a similar debate, and to seek answers about the effects that energy trading has on the price of crude oil and its supply. Some have now concluded that energy prices are pushed and sustained at high levels because of speculation, and that the large privately owned oil companies and financial banks are manipulating the market.

Oil is the world's most actively traded global commodity, and there are several different ways it can be traded. For example, oil can be traded on the "spot" market, which involves transactions for immediate or short-term delivery of oil at a specific site. Oil can also be traded through futures contracts, which are agreements to purchase or sell a given amount of crude oil at a price determined when the agreement is reached.

Futures contracts can be traded in two venues: 1) on the New York Mercantile Exchange (NYMEX) which is traded in units of 1,000 barrels of oil to be delivered at Cushing, Oklahoma, and 2) off the exchange in over-the-counter (OTC) transactions, which often occur through voice-brokers or online market platforms. Traders in each of these markets must follow certain guidelines, although the level of regulatory scrutiny that applies depends on the market in which the oil is traded in.

The requirements for future energy contracts are laid out in the Commodity Exchange Act (CEA), last amended in 2000 with passage of the Commodity Futures Modernization Act. These requirements include record-keeping and reporting, market surveillance, curbs on excessive speculation, and the establishment of various financial standards. And even though OTC contracts are traded without Commodity Futures Trading Commission oversight under current law, they are still subject to the CEA antifraud and anti-manipulations provisions.

In looking at how oil is traded, it is also important to focus on the fundamental basics of the market. In the global market, the price of oil is set by supply and demand conditions. Economics 101 teaches us that when demand is high and supply is low, the market will see an increase in price; when supply outpaces demand, the price of the commodity will decrease. Therefore, even as we examine the possible

role speculation has played in the increase of crude oil prices, we must not lose sight that high oil prices are being driven by many factors. These include increases in global oil demand, reduced supply, ongoing geo-political concerns, and decreased refinery capacity.

Since the beginning of this year, oil prices have increased by nearly 40 percent. While steep, this is not unprecedented—over the past 10 years, crude oil prices have increased by approximately 370 percent. Much of this increase occurred in the absence of heavy trading and is broadly attributed to the increase in global demand. According to the Energy Information Administration, or EIA, global demand for oil is projected to rise by 1.1 million barrels per day in 2007 and 1.5 million barrels per day in 2008. Total U.S. petroleum consumption is expected to increase by 0.5% in 2007 and 1.0% in 2008. This increase, which has brought demand levels much closer to supply levels, can be connected to the economic growth of the U.S. and to colder winter temperatures, which will continue to boost demand for heating oil.

With high prices and growing consumption, we need to find ways to increase our domestic production. Even though U.S. oil production is projected to average 5.1 million barrels per day in 2007, which is an increase of 0.3% from 2006 production levels, this is just a portion of the supply needed to meet the demand. And unfortunately this country still relies heavily on foreign oil imports and so the Organization of the Petroleum Exporting Countries (OPEC) needs to increase supply production to fill in the gap.

Currently, OPEC countries continue to be the largest oil producing countries and hold the largest percent of oil reserves. 77% of the world's oil reserves are located outside of the U.S., with a large portion held by national or state-owned oil companies. These reserves are considerably larger than the reserves owned by ExxonMobil, the largest multinational oil company. Yet, since November 2006, OPEC has decreased production by 1.2 million barrels per day, partially because of political instability in Nigeria, Venezuela, and Iran. Events in these countries have directly contributed to, and become a constant factor in, higher crude oil prices.

Related to the topic of increasing supply is the need to increase our ability to refine the supply, and to diversify the places where refining takes place. EIA reports that current domestic refinery capacity expansion plan estimates are approximately 1 million barrels per day by 2012, equivalent to five new refineries. But this figure is one-third lower than EIA's estimate in 2006, which projected refinery capacity of 1.5 million barrels per day in 2012. So domestic refining capacity is declining, but demand is still increasing.

We need to find ways to increase capacity at existing refineries. We need to explore, and promote, ways to build new refineries in places outside the Gulf of Mexico. Less capacity will not restrain demand—it will restrict supply, and ultimately increase prices at the pump. When supply and demand are tight, there is also little flexibility to accommodate unplanned refinery outages, which could have dangerous consequences.

Hurricane Katrina made it painfully clear that the lack of refining capacity in this country must be addressed. Almost 50% of the U.S. refinery capacity is located in the Gulf Coast. Hurricane Katrina shut down 10% of U.S. refinery capacity. We did not have spare space at other refineries to absorb that shock. Over the past several years, refineries have been consistently running close to 90 percent capacity utilization, compared to 78 percent utilization in 1985.

We need to ensure that new refineries are built. If we do not address the need for more refinery capacity in the United States:

- our dependence on imports for petroleum products will continue to increase,
- our record trade deficit will grow even larger as we have to import more finished products, and
- the number of skilled jobs lost from the construction, operation and maintenance of domestic refineries will increase, depriving hardworking Americans of a chance to earn a good living.

In spite of the increase in oil and petroleum costs, global oil markets will likely remain tight as world oil demands continue to grow. The best way to address this continuing issue is to increase domestic production, promote alternative fuels, and conserve greater amounts of energy.

As an Alaska Senator I would like to see development occur on shore from the Arctic coastal plain in Alaska. We also need to increase development in the outer continental shelf and to increase oil shale production in the West.

Mr. Chairmen, I appreciate your willingness to hold this hearing and examine crude oil speculation in greater detail. But this is also an opportunity to recognize that while speculation may contribute something to high oil prices, it is just one piece of a much larger puzzle. Those of us in Congress have a responsibility to en-

sure affordable energy for all Americans, but we will not succeed in this effort until we examine and address every factor which could be behind high prices. I look forward to hearing from today's witnesses, and, going forward, to working with the members of these Subcommittees to resolve this serious matter.

Senator LEVIN. Thank you, Senator Murkowski.

Let me now call upon the Ranking Member of the Homeland Security Committee, Senator Collins, and then we will call on the other Senators who are here in the order of their appearance for their opening statements, if they have any. Senator Collins.

OPENING STATEMENT OF SENATOR COLLINS

Senator COLLINS. Thank you. Thank you, Mr. Chairman. Long before the first official day of winter, the people of my State of Maine have been coping with cold weather and feeling the strain of high prices for home heating oil, gasoline, diesel fuel, and other products refined from fuel. According to the Energy Information Administration, last month, the benchmark price for a barrel of domestic crude oil averaged nearly $95. Compare that to $59 for November a year ago and you see a startling increase in a single year.

That remarkable rise touches virtually every aspect of our economy. Oil prices significantly affect the costs of heating homes, driving family cars and commercial trucks, running fishing boats, operating farm and logging equipment, flying airplanes, making fertilizers, manufacturing plastics—the list goes on and on.

Many causes contribute to the sharp rise in oil prices: Increased global demand for crude oil, instability in the Middle East and Venezuela, supply decisions of the OPEC cartel, insufficient U.S. refining capacity, the declining value of the dollar, and speculative trading on future markets.

I would note that Chairman Levin and I joined forces a few years ago on a bipartisan amendment directing the Department of Energy to better manage the Strategic Petroleum Reserve. We worked on legislation, which I was proud to be the cosponsor of Senator Levin's proposal, that the DOE should suspend purchases when prices were high so as not to further drive up prices by taking oil off the market. Now I question whether the intent of our amendment has been realized in the implementation by the Department of Energy.

Our paramount challenge, of course, is to reduce our over-reliance on imported oil. That dependence threatens our economic and national security. We need to pursue the long-term goal of energy independence just as fervently as the Nation embraced President Kennedy's goal in 1961 of putting a man on the moon.

In the meantime, however, we must increase funding for the Low-Income Heating Assistance Program and take other actions to ease the current impact of high prices. For example, Congress should pass carefully crafted legislation to help curb speculation on futures markets that can artificially drive up energy prices beyond what normal supply and demand considerations would produce.

As has been mentioned this morning by Senator Levin and Senator Coleman, an investigation by the Permanent Subcommittee concluded that speculators can create additional demand for oil, driving up the price even when they seldom deliver or receive any oil themselves. I have heard recently from the Maine Oil Dealers

Association and from commercial truckers in Maine who firmly believe that speculation has been a factor in the most recent oil price increases that are hurting their businesses and their customers.

Unfortunately, there is a lack of publicly available data to track the effect of speculation on market prices and manipulation can go undetected on certain unregulated markets, and that is why I support expanding the authority of the Federal Government to oversee energy futures markets and to provide greater transparency, which I think is the best safeguard against manipulation.

I recognize that such legislation must be carefully crafted, however. The ability to have contracts keyed to future prices can provide significant benefits. Legislation is needed, but it must be carefully targeted so as not to damage legitimate risk hedging functions.

Well-functioning markets obviously benefit consumers by promoting price competition, by encouraging the development of new products and by attracting capital for new enterprises. But it is also a fact that when the government and the public have little information about trades on unregulated or lightly-regulated markets, real abuses can occur. Unsupervised markets are open to deceptive practices and active or passive collusion. Government has a vital role to play in ensuring that markets are transparent and competitive, and regulators must have the information and authority that they need to limit excesses that can cause disruptive price swings or artificial increases in price levels.

This hearing will help us better identify and quantify the role of excessive speculation in the level and volatility of oil prices. It will also help us identify exactly what steps we should take to ensure that Federal regulators have the right tools to guard against manipulation and other abuses.

I want to commend both the Chairmen and the Ranking Members for their leadership in pursuing these issues and I look forward to the testimony of our expert witnesses. Thank you, Senator Levin.

[The prepared statement of Senator Collins follows:]

OPENING STATEMENT OF SENATOR SUSAN M. COLLINS

Long before the first official day of winter, the people of Maine have been coping with cold weather and feeling the strain of high prices for home heating oil, gasoline, diesel fuel, and other products refined from oil.

According to the Energy Information Administration, last month the benchmark price for a barrel of domestic crude oil averaged nearly $95. Compare that to $59 for November a year ago, and you see a 60 percent increase in a single year.

That remarkable rise touches virtually every aspect of the economy. Oil prices significantly affect the costs of heating homes, driving family cars and commercial trucks, running fishing boats, operating farm and logging equipment, flying airplanes, making fertilizers, manufacturing plastics, and so on.

Many causes contribute to the sharp rise in oil prices: increased global demand for crude oil, instability in the Middle East and Venezuela, supply decisions of the OPEC cartel, insufficient U.S. refining capacity, the declining value of the dollar, and speculative trading on futures markets.

I would also note that Chairman Levin and I joined forces a few years ago on a bipartisan amendment to the 2005 energy bill directing the Department of Energy to better manage the Strategic Petroleum Reserve by suspending purchases when prices were high so as not to drive up prices further by taking oil off the market. There are questions, however, about whether the Administration has implemented this program effectively.

Our paramount challenge, of course, is to reduce our over-reliance on imported oil. That dependence threatens our economic and national security. We need to pursue the long-term goal of energy independence just as fervently as the nation embraced President Kennedy's goal in 1961 of putting a man on the moon.

In the meantime, however, we must increase funding for the Low Income Heating Assistance Program and take other actions to ease the current impact of high prices. For example, Congress should pass carefully crafted legislation to help curb speculation on futures markets that can artificially drive up energy prices beyond what normal supply-and-demand considerations would produce.

In 2005, an investigation by this Subcommittee concluded that speculators can create additional demand for oil, driving up the price even though they seldom deliver or receive any oil themselves. I have heard recently from the Maine Oil Dealers Association and from commercial truckers in Maine who firmly believe that speculation has been a factor in the oil-price increases that are hurting their businesses and their customers.

Unfortunately, there is a lack of publicly available data to track the effect of speculation on market prices, and manipulation can go undetected on certain unregulated markets. That is why I support expanding the authority of the federal government to oversee energy futures markets and to provide greater transparency to guard against manipulation.

Such legislation must be carefully crafted, however. The ability to make contracts keyed to future prices can provide significant benefits, such as allowing heating-oil dealers and other businesses to hedge their risk exposure to future price changes. Legislation is needed but should be carefully targeted so as not to damage legitimate risk-hedging functions.

Well-functioning markets benefit consumers by promoting price competition, by encouraging development of new products, and by attracting capital for new enterprises.

But it is also a fact that when government and the public have little information about trades on unregulated or lightly regulated markets, real abuses can occur.

Unsupervised markets are open to deceptive practices and active or passive collusion. Government has a vital role to play in ensuring that markets are transparent and competitive. Regulators must have the information and authority to monitor trading and to limit excesses that can cause disruptive price swings or artificial increases in price levels.

This hearing will help us identify and quantify the role of excessive speculation in the level and volatility of oil prices, and highlight the steps we must take to ensure that federal regulators have the right tools to guard against manipulation and other abuses.

I commend the Chairman and the Ranking Member for their leadership in pursuing these issues and look forward to the testimony of our expert witnesses.

Senator LEVIN. Thank you, Senator Collins. Senator Wyden.

OPENING STATEMENT OF SENATOR WYDEN

Senator WYDEN. Thank you, Mr. Chairman, and I, too, want to join colleagues in commending you and the bipartisan leadership of both of these Committees.

I have been digging into this issue, as well, for a number of years. What really triggered it was 2 years ago—I think Senator Cantwell was there, as well—Lee Raymond, who was then the head of Exxon Mobil, came before the Energy Committee and I asked him about speculation in the oil market. And Mr. Raymond, obviously one of the most knowledgeable people in the oil business, said that he believed that speculation in the oil markets was adding $20 a barrel to the price of oil when oil was then $55 a barrel. I note we have experts at the table. Mr. Gheit has been quoted in the paper, obviously one of the most knowledgeable people in the business, saying that speculation is adding as much as $30 to the price of a barrel of oil.

So given what we came to learn from these experts, I began to look at the landscape with respect to speculation generally, and I think that Chairman Levin, Senator Coleman, and others described

how complicated this is. And it is quite clear that there are a variety of different ways in which the speculators engage in their various activities.

Some do it on the financial side, which is primarily what we have been talking about today, efforts that come under the jurisdiction of the Commodity Futures Trading Commission, agencies charged with overseeing the financial side. Some, and I am very concerned about this now and will touch on it in just a second, are simply buying oil and holding it. The effort to oversee this has been pretty much non-existent, which gets me to Mr. Caruso, I have always thought is a very good guy, but I think this agency really has its head in the sand with respect to the extent of this problem.

I want to read into the record now, Mr. Chairman, just a couple of comments from this agency, which is the lead agency, the lead Federal agency for analyzing information about prices and supply. They say, for example, in August 2006, "available evidence suggests that increased speculative activity in the oil markets is a symptom of rather than a cause of high oil prices." In their analysis in November 2007, they pretty much dismiss the whole issue because they say "it is difficult to assess."

Now, there is no question about that, because the markets are tight. Certainly they are volatile. These are all conditions where you would naturally have speculators try to take advantage of those factors, but that is all the more reason why the lead Federal agency in this area ought to get off the sidelines, abandon this "see no evil, hear no evil, speak no evil" approach, and get into the business of analyzing this information.

I will close, Mr. Chairman, by saying I am particularly interested in how they have responded to this question of those who are holding oil in the physical market. There is no doubt, and some of our witnesses are going to talk about this today, that there are a number of commodities speculators that are buying and holding oil, literally barrels of oil sitting in storage. Now, despite record prices for the purchase of each of these barrels, inventories have been above average because they obviously believe they can make good money when the price goes higher.

The Energy Information Agency reports inventory levels. When they were before the Energy Committee earlier, I asked that they report what data they had on who was holding the oil. The answer is they don't know because they don't collect the information. So they really don't have good data. And that is what they are supposed to be in the business of, on one of the key issues that I think the American people have a right to know as we dig into this speculation issue. I think they ought to be in the position of really looking at what is going on, collecting the sort of large trader information on, for example, physical energy inventory, and we get to the bottom of this. And we continue the work that you, Mr. Chairman, and our colleagues on a bipartisan basis are pursuing.

I thank you.

Senator LEVIN. Thank you, Senator Wyden.

On an early bird basis, let me see if the following Senators have opening statements. Senator Corker.

Senator CORKER. I would just as soon hear the testimony.

Senator LEVIN. Thank you very much. Senator Craig would be next.

OPENING STATEMENT OF SENATOR CRAIG

Senator CRAIG. Mr. Chairman, let me thank all of you for this hearing. Critical to the American consumer is the price of their energy, and we know that it is pinching, it is binding, it is distorting disposable income in households. It will change the way Americans think and react.

That is good in many respects as the markets change and as a need in pricing for new forms of energy begin to shape the market and shape our policy, and we see that happening now, Mr. Chairman, and it is critically important that, in part, it continue. Renewable fuel standards, diversity in the marketplace, a full portfolio of energy is increasingly important. We are all here scurrying to find resources to build incentives into new technologies and to the laboratory to bring things to market.

While all of that goes on, clearly, Mr. Chairman, transparency is important. There is no excuse for profiteering against the pocketbook of the poor, and the marketplace has to be transparent so that it is visible when it happens.

We also know, and I have listened to all of the statements this morning, I don't disagree with most of it. It is a phenomenally integrated world market with forces and demands that are new and different and diverse. At the turn of the century, 4 percent of the energy supply was oil. Today, it is now 96 percent when we talk about transportation. Whether it is Caruso or others looking at the markets in the out years, we know that by 2020, based on current demand curves, that it is going to be a 60 percent increase in demand. We have got to diversify. We know that. At the same time, we recognize current uses and the need to supply those uses.

I am not quite sure that I have any ability to look out 20 years from now and predict what the American economy will be like based on the adjustments it is currently making as a result of unprecedented high energy. Speculators will try to judge that. Markets will try to judge that. At the same time, in judging it, we ought to demand open and clear transparency in the markets so that those judgments are sound and so that the distortion is as limited as possible.

Gentlemen, I am anxious to hear from you.

Senator LEVIN. Thank you, Senator Craig.

Senator Tester has a statement that shall be made part of the record. He had to leave to preside.

[The prepared statement of Senator Tester follows:]

OPENING STATEMENT OF SENATOR JON TESTER

Thank you Mr. Chairman,

As the cost of oil has risen to record levels—Montanans along with Americans from across the country—have had to bear the cost of rising oil prices whether they are filling up their vehicles, heating their homes, or buying goods that were transported by truck, ship, or rail.

In the last 15 years, the price of oil has gone from selling consistently around $20 in the 1990's to $66 per barrel in 2006, and is projected to average $72 per barrel in 2007 with a possible increase to nearly $85 per barrel on average in 2008.

Oil prices are a complicated issue with global implications. China, India and other growing economies will continue to consume larger quantities of the world's oil sup-

ply and the demand will continue to grow exponentially. Furthermore, natural disasters like Hurricane Katrina and political upheaval in the Middle-East, Africa and South America disrupt supplies and increase the cost worldwide.

But the fact of the matter is that 100 dollar oil cannot be explained by supply and demand alone. Speculation in the crude oil market is driving up costs and making fortunes at the expense of the American consumer.

Normally I don't think the government should meddle too much in the affairs of business, but in the case of big oil companies and the companies that speculate and trade the product, there need to be some checks and balances. Energy is an issue with broad economic and national security implications and without taking steps to slow the pace of rising energy costs, the economy of our whole nation will suffer.

This issue also highlights the need of this Congress to pass an energy bill that creates a comprehensive strategy for energy production and conservation. It is mandatory that we act to ensure that Montanans can afford to fill up the tanks in their trucks and farm equipment, that Minnesotans can afford to pay their heating bills and the small businesses from New England to California have the resources to pay for their energy costs. Homegrown fuel, alternative energy and, and better fuel efficiency can all help get energy costs back in line with American consumer's ability to pay.

Senator LEVIN. Senator Barrasso is next.

OPENING STATEMENT OF SENATOR BARRASSO

Senator BARRASSO. Thank you very much, Mr. Chairman. While I am not a Member of this Subcommittee, I am a Member of the full Committee and the Energy Committee has an open policy of allowing Members to attend and thank you very much for allowing me to be here, Mr. Chairman.

Senator LEVIN. You are welcome.

Senator BARRASSO. Coming from Wyoming, whose economic well-being and tax base is so reliant on oil and natural gas production, I am particularly interested in today's discussion. Much of the oil production background is literally discussed every day around Wyoming's coffee shops. Even in the submitted testimony, they talk about a differential of $30 per barrel of oil when one of the refineries was down in Colorado a year ago. So this is a key point for us.

Our State coffers in Wyoming literally boom and bust on the prices of energy commodities. Revenues for our schools, our municipalities, our counties, and the State is closely tied to energy prices. Significant market moves, whether caused by natural disaster, by geopolitical forces, or basic supply and demand, have an enormous impact on my constituents and the government services on which they rely.

With respect to oil prices and the associated markets, I am here today to learn from this distinguished panel. From a legislative perspective, I want to make sure that the Federal Government is doing the right things, and if the government policies are causing harm to the market, I want to know about that and how we can participate.

From the demand side, I am here for my consuming constituents. As all of the other Members of the Senate testified, in Wyoming, I think we are even more impacted by gasoline prices due to the significant distances that my constituents travel from town to town.

Again, thank you for holding the hearing. I look forward to the discussion.

Senator LEVIN. Thank you, Senator Barrasso. Senator Cantwell.

OPENING STATEMENT OF SENATOR CANTWELL

Senator CANTWELL. Thank you, Mr. Chairman. I, too, want to add my thanks to you for holding this hearing. This is an issue that I have been involved in following since 2002 with Senator Feinstein when I first cosponsored her legislation regarding derivatives. I should just say that that experience, having dealt with the manipulation of electricity markets, with the perpetration of specific schemes to manipulate price, led us to an oversight and investigation about what statutes really are in place to protect consumers from these kinds of activities, whether they are the manipulation of physical supply and demand, or in this case that we are discussing today, in the moving around of resources.

I want to say to you, Mr. Chairman, I believe it is the Permanent Subcommittee on Investigations and their continued focus on this issue that will actually bring us results, because you are saying that we are going to hold the agencies accountable for the oversight that needs to happen here. So I want to thank you personally for your due diligence and to the Ranking Member, as well.

This simply today is a question about why oil should receive special treatment as a commodity that is traded. Now, when we look at this, this commodity, if you want to say that it is a commodity, we are spending $1 billion a day importing oil, and yet oil does not have the same regulations that other commodities have. They don't have the same recordkeeping, the reporting, the market surveillance, and the detection to prevent price manipulation, distortions, curbs, and excessive speculation and various other financial standards.

Now, why in America do we regulate, as I have heard before at various committees, things like corn, hamburger, orange juice, but when it comes to oil, we seem to think that it shouldn't have the same market transparency functions and market oversight of those other products?

And when people tried to say in the past, it is about derivatives, that somehow derivatives is too complicated for Members of the U.S. Congress to understand, they are wrong. We understand what is going on, and derivative contracts based on commodities, of agriculture commodities, cannot be traded on the future exchanges without those regulations. So you can't say that it is about derivatives because we have derivative agriculture products that we are not allowing to be over-the-counter trades. We are saying, no, there has to be transparency. There has to be reporting. There has to be bookkeeping. We have to be able to go in and see if manipulation has occurred.

So the fundamental question here today is why should oil be allowed to be traded on the ICE Exchange, on an international exchange, without the oversight to prevent, as my colleagues have already pointed out, that manipulation and speculation are not driving this market?

Now, there are lots of issues about speculation. There are lots of issues about speculation in any market. But that is why you have rules in place. That is why you have reporting. That is why you have accounting. That is why you have bookkeeping, so you can go back and track and make sure that it is not, as some people have been in my office saying, some of those in the energy field who

probably don't really like that their price has been speculated by hedge funds, that somehow people are holding supply off the shore, as my colleague Senator Wyden said, just to drive up the price so that 3 days later they can get the best price for the market.

Consumers are getting squeezed, and in my State, I just came back from looking at the flood damaged areas of Washington State and we are still paying over $3 a gallon for gasoline and still pay the highest in the Nation, along with California and Oregon. We cannot let a commodity like energy, which is the lifeblood of our economy and affects so many other areas of how well our economy will do, to continue to have these loopholes, and I hope that the gentlemen testifying today will help elaborate about why transparency and recordkeeping is so important to protecting the consumers and the price they pay at the pump.

I thank the Chairman.

Senator LEVIN. Thank you very much, Senator Cantwell. Senator Menendez.

OPENING STATEMENT OF SENATOR MENENDEZ

Senator MENENDEZ. Thank you, Mr. Chairman. I want to thank you and the other leadership of our respective Committees here for calling this hearing.

Oil prices and the market that set these prices are incredibly important to the world's economy, but it is also important to every aspect of working people's lives. Right now, Americans are paying twice as much for gasoline than they were 5 years ago, and if the price of crude jumps again as we approach next year's summer driving season, it would not be surprising if the price of gasoline reached $4 a gallon. The constant squeeze our citizens feel on their bank accounts are not isolated to gasoline, of course. The winter that we are upon is already seeing record home heating prices, which is devastating, particularly for those on a fixed income. And in addition, any product that needs to be transported to market is becoming more expensive as the cost of transportation rises and the domino effect, the ripple effect, continues.

With the unchecked rise in oil prices, people are losing faith in our markets. They see oil companies pocketing record profits. They see greedy market manipulators like Enron and Amaranth being caught and brought to justice, but they do not see actions being taken to make sure such crimes do not happen in the future.

And Mr. Chairman, when we see the difference between the extraction price, in essence, what it costs to physically extract a barrel from the ground, and where oil is being sold at today, we see that there is a very significant difference, and whether that is by possible manipulation or a lack of transparency, I think the consumers have a right to have faith in this market of such an incredibly important commodity in their lives.

And at the same time, moving beyond the domestic for a moment to the international, it seems to me that this is a huge boon to oil exporters who reap the benefits, as well, like Iran, which we are all engaged in a great debate on these days. There are some estimates that they are getting another $5.5 billion extra a month because of this premium, so to speak. So it is interesting. We talk

about sanctions. Just the call for sanctions raises the price of the oil, therefore giving Iran more money.

We look at this whole process and the lack of transparency and manipulation, and I agree with Senator Cantwell about why should oil be the one commodity, and that is why I am proud to have joined you, Mr. Chairman, in your legislation. I am an enthusiastic cosponsor of your Close the Enron Loophole Act and I am hopeful that this will give us the opportunity to ensure that our markets function properly and restore people's confidence specifically in the commodities markets that are so critical in their personal lives, and I look forward to the testimony of the witnesses.

Thank you, Mr. Chairman.

Senator LEVIN. Thank you, Senator Menendez. Senator McCaskill.

OPENING STATEMENT OF SENATOR MCCASKILL

Senator MCCASKILL. Thank you, Mr. Chairman. As others have said already this morning, in the last 5 years, we have seen almost a 100 percent increase in speculative trading on crude oil futures and that is just the trading we know about. That doesn't count all the trading we can't track that is not through a regulated exchange.

During that same period of time, as Senator Menendez said, gas prices have doubled. The purpose of this hearing is to try to figure out what is driving that increase.

Well, I am positive of one thing. I am positive that America's middle class and working families are not behind the wheel driving this increase in speculation. Something has changed that is causing this massive amount of speculation that we have not seen before, and I think it is hard for us to imagine that it is not connected to the massive increase we have seen in gasoline prices for the people that I represent in Missouri. Greed is driving the speculation and grossly inadequate oversight to prevent manipulation.

Who benefits from the unregulated markets? I think that is the question that we must try to answer today. I hope that the witnesses will think about that question in the context of their testimony. Who is benefiting from the unregulated markets? Speculators, no question about it. Oil companies, hard to imagine they are not, but we need to figure that out. Missourians who are paying more for gasoline than they ever imagined possible, I don't think so.

I think it is very important that we try to get to the bottom of this, and we all understand, and I don't think we need to be told, the importance of liquidity in commodities markets. But as Senator Cantwell so articulately said, this is a commodity. It should be treated no differently. And until we treat it the same as other commodities, the American public is always going to assume that they are getting the short end as opposed to those who are sitting at the trading table making hand over fist.

Thank you, Mr. Chairman, for holding this hearing today. I appreciate the opportunity to make a statement.

Senator LEVIN. Thank you, Senator McCaskill.

Let me now welcome our panel of witnesses to this morning's hearing: Guy Caruso, Administrator of the Energy Information Ad-

ministration at the U.S. Department of Energy; Fadel Gheit, Managing Director and Senior Energy Analyst at Oppenheimer and Company in New York; Edward Krapels, the Director of Natural Gas and Power Markets at Energy Security Analysis, Inc., in Wakefield, Massachusetts; and Philip Verleger, Jr., President of PK Verleger, LLC, in Newport Beach, California. We welcome you this morning to this joint hearing of our two Subcommittees.

Pursuant to Rule 6, all witnesses who testify before the Permanent Subcommittee on Investigations are required to be sworn. Since this is a joint hearing, we will follow that rule. We would ask all of you to please stand and raise your right hand.

Gentlemen, do you swear that the testimony you are about to give before our two Subcommittees is the truth, the whole truth, and nothing but the truth, so help you, God?

Mr. CARUSO. I do.

Mr. GHEIT. I do.

Mr. KRAPELS. I do.

Mr. VERLEGER. I do.

Senator LEVIN. A timing system today will give you a yellow light about 4 minutes from the time you begin, giving you a minute to conclude your remarks. We would very much appreciate it if your oral testimony consumed 5 minutes. We will put your full statements in the record, of course, and we will start with you, Mr. Caruso. Thank you for being here.

TESTIMONY OF GUY F. CARUSO,[1] ADMINISTRATOR, U.S. ENERGY INFORMATION ADMINISTRATION, U.S. DEPARTMENT OF ENERGY

Mr. CARUSO. Thank you very much, Mr. Chairman, Chairman Dorgan, and Members of both Subcommittees. It is an honor to be here to discuss recent developments in crude oil markets and the factors contributing to the increase in petroleum prices. The Energy Information Administration is the independent statistical and analytical agency within the Department of Energy. Our views are strictly those of EIA and should not be construed as representing those of the Department or the Administration.

Oil prices have trended upward over the past several years, as a number of the other witness statements have indicated. The price of West Texas Intermediate (WTI), crude oil has climbed from $56 on average in 2005 to almost $100 per barrel last month. With these rising prices, oil markets have drawn the increasing interest and participation of investors and financial entities who do not directly engage in physical oil markets.

The precise impact of these non-commercial market participants, as Senator Wyden pointed out, is difficult to assess. EIA believes that tight supply and demand fundamentals are the main drivers behind the rise in oil prices over the last several years. These factors include strong world economic growth, leading to increases in consumption; moderate growth in supply from non-OPEC nations; production decisions by members of OPEC; low spare production capacity in the world; tight global commercial inventories; refining

[1] The prepared statement of Mr. Caruso appears in the Appendix on page 67.

bottlenecks around the world; and ongoing geopolitical risks and concerns about supply.

Strong economic growth around the world continues to foster strong oil demand growth, with China, other developing countries in Asia, and the Middle East countries projected to account for a large share of the total world oil consumption growth this year and in 2008. At the same time, growth in non-OPEC production has been significantly less than growth in consumption. This is concentrated in a few areas and there have been project delays and increasing decline rates in Mexico, the United Kingdom, and Norway. As a result, supplies must increasingly come from OPEC members or from inventories.

OPEC members have altered production targets over the past few years, thereby keeping markets fairly tight. EIA expects OECD commercial inventories measured on a days supply basis to remain in the low end of the 5-year range in 2008.

World surplus production capacity is expected to remain fairly low, averaging two to three million barrels per day through 2008, leaving the market vulnerable to unexpected supply or demand events that put upward pressure on prices. Because of the lack of supply or inventory cushions and low short-term price responsiveness of demand, large price increases are required to rebalance supply and demand.

In the downstream markets, there is a low level of excess refinery capacity worldwide, which reduces flexibility when supply and demand balances are tight or there are unplanned refinery outages.

Geopolitical instability in many OPEC as well as non-OPEC countries also puts additional upward pressure on inventory demand and crude oil prices.

Some oil market observers are citing speculation as the main driver of the current high prices. However, the staff of the Commodity Futures Trading Commission have analyzed the behavior of managed money traders and found that they are most likely to follow than to lead position changes by other market participants. There have been many instances over the past few years when crude oil futures prices have risen along with an increase in the net long positions of non-commercial participants, that is, more buyers than sellers. However, there have been key periods in which the net position of these non-commercial participants did not move in the same direction as prices, particularly in July and early November of this year.

It appears that any correlation between speculative activity and rising prices is loose, at best. Evidence, reinforced by the CFTC study, suggests that speculators shift positions in response to price changes. If the tight supply and demand conditions weaken or are expected to weaken, we would expect speculative activity to decline, as has been seen very recently. Speculators and others are investing in oil markets because of tight market fundamentals and geopolitical security. Increased speculative activity is more of a symptom of market conditions than the cause, in our view.

This completes my oral statement, Mr. Chairman, and I would be glad to answer any questions at the appropriate time.

Senator LEVIN. Thank you very much, Mr. Caruso. Mr. Gheit.

TESTIMONY OF FADEL GHEIT,[1] MANAGING DIRECTOR AND SENIOR OIL ANALYST, OPPENHEIMER & CO., INC., NEW YORK, NEW YORK

Mr. GHEIT. Thank you for having me. I have over 30 years of energy industry experience, the last 21 years as an analyst on Wall Street. My view, which represents my own and does not represent the company that I work for, which is Oppenheimer and Company, oil is unlike any of the commodities that we deal with. It is critical to global economic growth and our national security. It impacts our lives, influences our national policies, both domestic and foreign, and is likely to play a key role in shaping our future.

Over the last 40 years, oil prices fluctuated from under $3 to a record of more than $98 only a few weeks ago. Oil traders and the media were cheering the rising oil prices and hoping for oil to break the $100 mark. Some analysts even predicted that oil prices are heading for $120 by the end of this year and expect it to be between $150 and $200 next year.

I don't know where oil prices will go next month or next year, but I believe that the current high oil prices are inflated by as much as 100 percent. I don't think industry fundamentals of supply and demand justify the current high prices, which I believe are driven by excessive speculation. Based on various press accounts, others who share this view include our Energy Secretary, most OPEC ministers, and the heads of major international oil companies.

Oil prices were close to $60 per barrel in August, rose sharply to almost $100 in November, although there was no changes in world supply and demand. The price surge, in my view, was a result of excessive speculation about potential supply disruption in the event of a military attack or strike against the Iranian nuclear facilities. The passing of the Senate resolution regarding the Iranian Revolutionary Guard as a terrorist organization seems to have been the catalyst speculators needed to fan the fire. The drop in the value of the U.S. dollar against major currencies also pushed for higher oil prices.

No one has been able to accurately and consistently forecast oil prices, not oil companies, government, or people on Wall Street. However, this lack of reliable oil price forecasting has created a vacuum that has been filled, in my view, by financial players with very short investment horizon, which significantly increased the price volatility. Globalization of the financial market, ease of trading, rapid movement of large sums of capital, information overflow, and increased global tension have created an ideal environment for excessive speculation in the world market.

Oil price volatility has attracted a large and growing number of speculators seeking the highest profit in the shortest time. Volatility, however, has an adverse impact on the oil industry because it increases uncertainty and distorts market fundamentals, which could result in poor investment decisions in securing adequate supply to meet world growing demand for oil.

The oil industry operates in an environment driven primarily by factors it does not control—global economic growth, increased world

[1] The prepared statement of Mr. Gheit appears in the Appendix on page 76.

oil demand, and reduced OPEC spare production capacity to historically low levels. Non-OPEC production is hampered by project delays, rising costs, and technical problems. These factors increase the risk of potential supply tightness.

I believe that the oil markets need assurances from leaders of both major exporting and major importing countries as well as the oil industry. People need to know that the world is not running out of oil, that supplies are adequate, and that global stockpiles are sufficient to make up for any potential supply shortfall or demand surge. It is worth noting that the current global oil inventories of more than four billion barrels exceed the oil export volume from Iran for more than 2½ years, and Saudi Arabia for 15 months, and the entire Middle East for 6 months.

I believe that oil speculators use weekly petroleum data published by the Energy Information Administration to manipulate oil prices for their short-term gain. Speculators have used declining inventory levels to spread fears about potential shortages, when in fact it indicates exactly the opposite. Reducing inventory levels improves capital efficiency, especially in a high oil price environment. In addition, oil price backwardation makes it even more prudent for the oil industry to reduce inventories further. But more importantly, declining inventories, in my view, underscore that the industry is less concerned about shortages and is more confident about supply availability.

While oil trading helps with its long-haul crude shipment against price volatility, I believe it should be regulated to ensure transparency, discourage excessive speculation, and prevent potential conflict of interest and abuse by traders. Several measures should be considered to regulate oil trading by financial players, including major investment banks, the commodity traders, hedge funds, and private equity funds. These include raising the current margin requirement to 50 percent of the value of the trade; setting limits on the number of oil contracts by each account; establishing a minimum holding period to hold these contracts; preventing conflicts of interest by financial institutions; and finally, imposing stiff penalties on violators, including minimum jail sentences. Thank you.

Senator LEVIN. Thank you very much, Mr. Gheit. And now, Mr. Krapels.

TESTIMONY OF EDWARD N. KRAPELS,[1] SPECIAL ADVISOR, FINANCIAL ENERGY MARKET SERVICES, ENERGY SECURITY ANALYSIS, INC., WAKEFIELD, MASSACHUSETTS

Mr. KRAPELS. Good morning. Thank you, Mr. Chairman, Senators. Thank you very much for the invitation to come here. I am speaking today as a representative of my consulting company, Energy Security Analysis. We have been in the oil market forecasting business for 25 years, and as a matter of corporate survival, we have to take into account all the factors that influence oil prices.

About 10 or 15 years ago, we began to divide the oil world into two sets of forces, physical and financial, and so you can see that from our perspective, we look at the fundamentals of financial mar-

[1] The prepared statement of Mr. Krapels appears in the Appendix on page 78.

kets as being as important to the price of oil and gas as the fundamentals of physical markets. That is my first point.

Let me make four more practical points, because my old friend Phil Verleger is here and he is a true economist and I am a practical economist. Let me make four points as a practical guy.

The discussion about the proper influence or how to depict the influence of speculators on oil prices to me often achieves a level of how many angels can dance on the head of a pin. When you get formal trained economists to address this problem, they will usually say, "I am sorry, we can't find a correlation." But when you look at the market from the standpoint of a practitioner or people in the financial business, you will hear anecdotal evidence all the time that of course, financial trading is influencing the price of oil. I am in that camp.

Of course, financial trading and speculation affect the price of oil because they affect the price of everything we trade. We live in a trading culture. We have funds that flow out of the dot-com sector into the housing sector, out of the housing sector into the commodities sector. Wherever these trillions and trillions of dollars go, they affect the price of whatever it is that they are trading. It would be amazing if oil somehow escaped this effect.

So there is a bubble in oil prices that has lasted for several years, and in my opinion, it will last for several more years because the underlying condition of the world oil market is extremely tight and the demand responses, unfortunately, are very slow.

My next point is do we have information that indicates how this mechanism works, and I suggest that the outstanding work done by your own staff on the Amaranth case and published last year in your special report constitutes the best piece of work I have seen in this respect and I congratulate the staff for the outstanding work that they did. Clearly, here was a market that was manipulated by a very large trader that from time to time had 40 or 50 percent of the open interest in the NYMEX market, and that was only the visible market because we didn't know how large their positions were in other markets. So for me, the debate is over. Of course, speculation affects commodity energy prices. There is no question about it.

My next question, though, is what do you do? What do you do about that? I think that Mr. Gheit has told you, and I think your own staff has told you the things that need to be done. You do need to regulate these markets in the way that you have traditionally regulated these markets. I come out of the R.H. Coase School at the University of Chicago. R.H. Coase pointed to a paradox decades ago. He is a Nobel Prize winning economist. He said, isn't it paradoxical that the best markets have very clear regulation, and he pointed to American commodity markets as prime examples of that effect.

We need to simply hold all the exchanges that trade energy to the same standards that we hold the New York Mercantile Exchange. I think the New York Mercantile Exchange is an outstanding market. The WTI market is a wonderful market. We simply need to have more disclosure, more information about how these other markets trade.

The solution to the problem of what do we need to do about these exchanges is simple to me. It is disclosure, disclosure, disclosure. We simply don't have enough information. When your staff got the information through their subpoenas, they were able to see the effect that Amaranth had. The rest of us, including my clients, which include universities and people who buy oil, would love to have had that information about what the effects of the speculation on natural gas prices was, but we didn't have it because the CFTC didn't release it.

So my last point, and this is awfully important, I think futures markets, like all the rest of you, I think futures markets are invaluable, that we need the liquidity, we need the financial services, we need the ability to hedge. So whatever we do, we mustn't throw out the baby with the bathwater. It is not an onerous obligation to say to the futures markets in energy, hold to these high standards that the NYMEX has. If we do that, I believe that we can have very effective oil and natural gas and power forward markets that are in the interests of all of us. Thank you very much.

Senator LEVIN. Thank you very much, Dr. Krapels. Dr. Verleger.

TESTIMONY OF PHILIP K. VERLEGER, JR.,[1] PRESIDENT, PK VERLEGER, LLC, ASPEN, COLORADO

Mr. VERLEGER. Senator Levin, thank you very much. Thank you for your kind comments on your introduction. It is a pleasure to appear here again and I thank the Senators for coming. It is a real pleasure to appear in this famous hearing room.

Let me associate myself with Mr. Krapels's comments and especially with the comments on the Subcommittee's report on Amaranth. I have been studying the futures markets as an academician and policy maker for 20 years—and that report is the best. I learned more from it, particularly the deep data digging.

Senator LEVIN. Thank you.

Mr. VERLEGER. This is an important hearing, particularly on oil prices, and let me summarize my testimony. It is 20 pages and I will do it in 4 minutes.

The rise of prices to almost $100 a barrel is first led this year by the removal of light sweet crude oil from the market by DOE beginning in the middle of August.

Second, the price has also been pushed higher by liquidation of inventories. Senator Wyden would like to see inventories lower. We are all going to see substantial liquidation of inventories. Inventories are built or liquidated according to profit incentives. The incentives to hold inventories were profitable last year and in part by investment in passive futures. They are not profitable now and we are seeing massive liquidation.

Third, sweet crude oil demand is being boosted by environmental regulations, particularly the new regulations requiring the limit of sulfur to 10 parts per million in both the United States and in Europe in diesel fuels.

Fourth, I have been studying the oil market since 1971 and have been policy maker. I can't find any international event which explains why oil prices have risen recently. And as I said, I have been

[1] The prepared statement of Mr. Verleger appears in the Appendix on page 98.

writing about commodity markets, studying futures markets. I think this is speculation.

Let me start my prepared testimony at Figure 1 on page three of my prepared statement.[1] I show there the price of WTI from January through December last year and January through November of this year. In that graph, I have taken the price of WTI from February through this last August by calculating the price of Brent and adjusting it using the traditional differential because the WTI market, as Senator Levin noticed, was distorted with the shutdown of a single refinery, the Valero McKee refinery.

If you look, the price last year up until August was identical, within 50 cents to a dollar a barrel, to this period of time. Then, since August, we have had the largest increase in prices in 30 years in absolute terms. It exceeds the price increase for the fall the Shah fell. It exceeds the price when Iraq invaded Iran. And it exceeds the price increase that we saw in 1990 when Iraq invaded Kuwait.

Why is this? Well, if you look at a series of factors as a detective you cannot find any event such as a change in demand in China or in India this year to explain the increase. You also cannot attribute it to a shortage of crude oil on world markets. Between August and December, Saudi Arabia cut its price of oil by $10 a barrel. The Saudis couldn't sell their crude. You also can't explain it at this point by speculation.

Now, in speculation, I want to distinguish between investors and speculators. Investors have poured billions of dollars—and if you turn to Figure 4 on page six of my prepared statement to a graph we prepared[2]—into passive investment vehicles, the Dow Jones AGI Index and the S&P Goldman Sachs Index. These are pushed by academics who argue that, in fact, commodities are an investment class. They earn returns like bonds and like assets and it is better to invest in these diversified commodities than, say, an oil company. We have seen money go up, but it is steady. It is not volatile.

You can, to a certain extent, explain the price increase by the change in the profitability of holding oil, and I show in Figure 8,[3] nine graphs which show the return on investment, that is how much money a company made, and last year, companies could buy oil, put it in tanks, and earn a return that was seated on bonds. Not now.

But the big change that came since August of this year was the decision to put oil in the SPR, to take royalty in kind, and the decision to take sweet crude oil, because the sweet crude oil they are taking accounts for between three-tenths and six-tenths of a percent of the world's available sweet crude supply. Only 6 million barrels a day of world supply qualify for going into sweet crude for the SPR. Given the pressure for, need for light sweet crude, particularly in refining to make the low-sulfur diesels and other low-sulfur products, this has created a tightness on the market. If you apply the standard price elasticities, and Senator Dorgan taught economics, for demand for crude oil, particularly the ones Professor

[1] Figure 1 appears in the Appendix on page 100.
[2] Figure 4 appears in the Appendix on page 103.
[3] Figure 8 appears in the Appendix on page 106.

Nordhaus has produced at Yale, you come to the conclusion that this probably added $8, maybe $5, maybe as much as $10 a barrel to the price, just in terms of demand.

This then was magnified by what is called delta hedging in the market. Many consumers have hedged their fuel costs using options. To do this they buy options so that if the price goes up, they still get their oil at $50 a barrel. This is a good way of hedging.

But as the price goes up, the firms that have written those options have to buy more crude. Last year, when the prices started to fall after August 18, producers of crude oil who had bought puts were protected and the financial firms sold futures, so what happened is prices fell, say, to $60 on a cyclical decline and they were pushed down to $50 a barrel by what we call delta hedging in the financial community.

This year, as the price has been pushed up from $75 to $80 as oil was added to the SPR. This created a need by the banks and the other financial institutions that have written the options to buy oil futures. The purchases accelerated the price rise to $100.

Now, my view—and I have always been an outlier of views on oil markets—this view is not widely held and I commend the Department of Energy, we are going to get a test of how right I am because they are going to double the rate at which they put sweet crude oil into the market over the next 6 months, from January until June.

Senator LEVIN. Into the market?

Mr. VERLEGER. Into the Strategic Petroleum Reserve. Excuse me. If, in fact, I am right, we are going to see prices be magnified up again by delta hedging because the physical refiners who need the light sweet crude will be bidding the price higher. They will be competing with DOE and we could see prices, if the experience from last August to November applies, we could see prices go, say, to $120 a barrel. If I am wrong, and I hope I am wrong, it won't happen. But all the economics now plus the way people hedge in terms of using options, particularly the airlines, other end users, set us up for an even larger price increase over the next 6 months.

Thank you very much, and I am sorry to have gone over my time.

Senator LEVIN. Thank you very much, Dr. Verleger.

Mr. Caruso, let me start with you. Exhibit 14, if you will take a look at it, it shows that the number of speculative trades in crude oil has tripled from 2000, and these trades from speculators used to make up 15 percent of the outstanding crude oil future contracts on NYMEX.[1] Now they make up 35 to 40 percent of the outstanding contracts, so-called open interest. Is that dramatic increase shown by that chart in outstanding crude oil future contracts relevant? Might it be relevant in terms of oil prices? Just might it be relevant?

Mr. CARUSO. Definitely. I would agree with Mr. Krapels's comments that speculative trading has had an impact on the market. My distinction is it is not the cause of the rising prices, it is following the market up.

Senator LEVIN. Well, you said it had an impact——

[1] See Exhibit No. 14, which appears in the Appendix on page 201.

Mr. CARUSO. It is not the driver of the market. It is part of the reason prices have gone up. We are not saying that it is irrelevant. It is definitely relevant and it is definitely part of the reason that we are seeing prices go up. We are just saying we can explain most of the change by the fundamental factors and the geopolitical risks——

Senator LEVIN. Right. It might be a cause of increased prices?

Mr. CARUSO. It is part of the combination of factors.

Senator LEVIN. So it may—I am not saying it is the cause. I am saying it might be a cause.

Mr. CARUSO. It is one of the many causes, yes.

Senator LEVIN. What are you doing to determine the extent to which it is a cause? In your statement, the Energy Information Administration issued a report a few weeks ago that says, with the rapid rise in prices, oil markets have been drawing increased interest and participation from investors in financial entities without direct commercial involvement in physical oil markets. Those are folks we call speculators. The role of these non-commercial future markets participants in recent price developments is difficult to assess.

Mr. CARUSO. Yes.

Senator LEVIN. Now, since there, in your judgment, may be a cause, and you are the most cautious on that—at least our other witnesses say they are clearly a cause, but your Administration says they might be a cause—instead of looking at the extent to which they are a cause, you turn to general principles. You say, let us focus instead on general principles because that favors a focus on fundamentals rather than consideration of alternative price drivers.

Well, fundamentals obviously also have a major role, but since this amount of speculation even in your judgment may be a cause, and you are the most understated witness we have got here, but nonetheless it may be a cause, I want to know why your Administration is not acting to determine the extent to which it is a cause. Instead, you just simply go back to, we are going to look at the fundamentals.

Mr. CARUSO. We look at all——

Senator LEVIN. Why don't you look at that?

Mr. CARUSO. We are looking at all the factors and——

Senator LEVIN. To what extent are speculators a cause?

Mr. CARUSO. I don't think it is possible to actually accurately estimate the dollar amount, but——

Senator LEVIN. How about a percentage?

Mr. CARUSO. I don't think it is possible.

Senator LEVIN. But are you trying?

Mr. CARUSO. And what we do is rely on those who are providing the oversight and the enforcement, such as CFTC, and we rely on the studies that they have done and their studies show that it is not the fundamental cause of the prices going up.

Senator LEVIN. So long as it may be a cause, it seems to me you are not doing your duty by not looking at the extent to which it is a cause. You have got very capable people, including witnesses sitting right next to you, who believe it obviously has a significant impact, and yet your Administration, which is supposed to deter-

mine these kinds of issues, has basically delegated that to someone else, and that is a major problem, I believe. And so all we can do is tell you that we think—I am speaking for myself, obviously—that the Department of Energy is failing to do what consumers in this country rely upon you to do, and that is to look at the causes of these oil prices skyrocketing. You have abdicated that. You have delegated that. You acknowledge it may be a cause, this excessive speculation, and yet you have not done your own analysis.

Finally, before my time runs out, let me quote not just the Exxon Mobil chairman that was already quoted here this morning, but also Lord Browne, who when he was the BP Group chief executive said the following recently in 2006. "There has been no shortage of inventories of crude oil and products have continued to rise. The increase in prices has not been driven by supply and demand." You disagree with that, is that true?

I want to repeat it. "The increase in prices has not been driven by supply and demand," Lord Browne.

Mr. CARUSO. I think the increase in prices has been determined by supply and demand and other factors, such as geopolitical risks which also have contributed to the speculation, in a sense, is what we are saying. It is a combination——

Senator LEVIN. Whatever has contributed to the speculation, wouldn't you agree that the tremendous increase in the amount of speculation that has gone on is likely to be a factor in the increase in prices? Can we get that much out of you?

Mr. CARUSO. I would agree, it is a factor, and our analysis of the fundamentals indicates it is not a large factor, and we have done our diligence on this and we think it is part of the factor, but not a major factor.

Senator LEVIN. Well, the diligence that you refer to is the CFTC that you have delegated this assessment to.

Mr. CARUSO. No, we have done our own work and then we have looked at other studies, such as CFTC, such as the IMF, other academics who are experts in the field of oversight and enforcement in the financial and commodities markets.

Senator LEVIN. OK. My time is up. Senator Dorgan.

Senator DORGAN. Mr. Chairman, thank you very much.

Mr. Caruso, I have been looking at your appropriations. I chair the Appropriations Subcommittee that funds the EIA and I was in the last week taking a look at how many people we have down there and what we are getting out of EIA, and I was just thinking about this as you were answering these questions. Your organization plays a very important role and has a very important function and Senator Levin is trying to understand what appears to be a contradiction.

I think what you are saying today is that the fundamentals exist that are supportive of the current price trends in oil. Do you mean that you look at the fundamentals and say you believe the fundamentals support and justify what is happening to prices.

Mr. CARUSO. Not "justify." I am saying that we can explain the behavior of the oil market by looking at the fundamentals of supply and demand and the other factors that go into decisionmaking by participants in the marketplace, such as concern over Iran, Iraq, and Nigeria. So it is a combination of all of those factors.

Senator DORGAN. Let me put up a chart.[1] Again, when I was looking at it, we spend about $100 million a year, roughly, for what you all do, and I want you to do it and do it well and provide us a lot of very important information. We need you to do your job well.

One of the witnesses mentioned the decrease in the price of Saudi light crude relative to the price of west Texas Intermediate crude since May 2007. Since May 2007, the spot price of oil has skyrocketed $30 a barrel, but the Saudis have had to continue to discount the price of their Saudi light relative to WTI crude by pricing it by nearly $10 a barrel discount.

Now, it seems to me that just suggests that this is not market fundamentals. There is something upside down, something not working here. Do you sense that, as well? Is there something wrong with that?

Mr. CARUSO. Well, one of the factors that is not reflected in this chart is that at the same time as prices were behaving such as they are shown here, the Saudis were actually reducing production.

Senator DORGAN. But that is not the issue. The issue is at what price are they selling what they produce? You have just changed the subject on me.

Mr. CARUSO. Yes.

Senator DORGAN. When they have to discount by $10 a barrel what they are selling, isn't that at odds with the suggestion that the market system is working, that the fundamentals of supply and demand somehow work? It seems to me that relationship is counter to that. Do you agree with that?

Mr. CARUSO. I would agree with that. But at the same time, the Saudis have been leaders within OPEC to try to prop up the price of oil through——

Senator DORGAN. Again, a different subject, but let me go to a couple of the other witnesses. I am trying to understand what we are learning here. It seems to me that there is a massive amount of speculation occurring, and one of the witnesses—maybe it was you, Dr. Verleger—you talked about the DOE's decision to fill the SPR, and I want to come back to Mr. Caruso to see whether DOE got information from you about what the impact of that might be.

You talk about the price impact of the decision to fill the SPR with sweet crude and that the total world market for that is five million barrels, and then you indicated that was amplified by option hedging. I want to try and understand that a little more. Can you amplify on that?

Mr. VERLEGER. I would be happy to, sir. There are a number of types of derivatives. The futures is the standard that we have had for 150 years. There are options on futures, through which a firm takes a long position or a short position. It is not obligated to take delivery. The option is essentially an insurance policy.

So Southwest Airlines has bought call options on crude oil that keep its cost of crude oil at about $50 a barrel this year, next year, and the year after. That means if the price falls below $50, they pay a lower price because they are not required to take delivery.

[1] See Exhibit No. 8, which appears in the Appendix on page 129.

The firms that write the calls write an insurance policy to Southwest. These firms will buy futures as prices rise. This is called delta neutrality. When the prices go up, they buy futures.

This year, what we have seen is we got the additional upward push in the light sweet crude price of $5 to $10 a barrel from the DOE policy. Then the firms that had written calls to Burlington Northern, to many other major consumers and speculators who buy calls had to buy futures to protect themselves. This magnified the price increase. This is why, as I said, this is the largest price increase in a 90-day period of time in 30 years.

Senator DORGAN. And that is very important and I appreciate the answer and the better understanding.

Mr. Gheit, I have seen in print, that you said there is not any justification for the price of a barrel of oil given the fundamentals these days to be over $55 a barrel. Is that correct?

Mr. GHEIT. Absolutely.

Senator DORGAN. You feel strongly about that?

Mr. GHEIT. The industry can replace a barrel of crude today profitably and at less than $15 per barrel. There is an old rule of thumb that you expect the price to be three times what your replacement cost is, and the industry replacement cost could be well below $15 a barrel. That is given the fact that we still have access to reserves who have obviously been closing down between Russia and Venezuela and elsewhere. But having said that, rising costs in the industry, and with that all said, the industry can still be profitable at $45 oil.

Senator DORGAN. One final question, Mr. Chairman. I am trying everything I can in some sort of an omnibus bill, some sort of appropriations process, to put a stop to this royalty in kind, taking sweet crude off the market and sticking it underground at this point. That is absolutely nuts, in my judgment. I am running into all kinds of bureaucratic problems in trying to stop the Department of Energy from continuing that activity and exacerbating it. But I still hope we can get that done.

Mr. Caruso, has anybody at the Department of Energy consulted EIA and asked what the impact would be if we take sweet crude and start sticking it underground storage at current prices? Has anybody asked you what the impact would be?

Mr. CARUSO. I have not been asked, no.

Senator DORGAN. Should they have asked you?

Mr. CARUSO. Well, we are available.

Senator DORGAN. What would you have told them? Would you have told them what Dr. Verleger just suggested, that it is going to pump up the price of oil on the markets and it is going to exacerbate the price problem?

Mr. CARUSO. I don't know. Listening to Mr. Verleger's argument, it seems to be what he is saying is that world oil prices are really hyper-sensitive to these very small changes in light sweet crude, and I am unconvinced of that—because we have had large changes in light sweet crude, such as in Nigeria, a reduction of 500,000 barrels a day. We have had nothing like the kind of rise in price that Mr. Verleger has alluded to in the last part of 2007. So I have trouble reconciling how such a small reduction of supply of light sweet crude—I think it is about less than 20,000 barrels a day—could

have caused such a large price change. Whereas in Nigeria, a much larger reduction, 500,000 barrels a day, did not cause that big of an increase.

Senator DORGAN. My time has nearly expired.

Mr. CARUSO. So I have a problem with——

Senator DORGAN. Mr. Verleger, do you want to respond to that?

Mr. VERLEGER. It depends on when the timing of the cut is. I mean, we had high inventories thanks to the actions of the financial firms. Mr. Krapels and I were in Vienna a year ago talking with the OPEC and EU countries about this, and since the money has come out and the stocks have gone down, markets are much more sensitive. But Mr. Caruso raises an interesting question. The royalty in kind oil is oil that is there. It is dependable. This is an expectation phenomena. And Nigeria's oil is oil that oil producers always are a little more concerned, and it goes to another market. The Nigerian oil—well, some of that oil doesn't come here, so I would have to look at that.

Senator DORGAN. Let me just thank the witnesses, and Mr. Caruso, I would like you to be the whistle on the teapot here, but I don't hear a whistle from you. I just hear you sort of saying, well, things are OK and we look at the market. It all adds up. I don't think it adds up at all. Mr. Chairman, thank you.

Senator LEVIN. Thank you very much. Senator Coleman.

Senator COLEMAN. I thank you, Mr. Chairman. I am trying to understand what we do about what we are learning. I think we have learned in certain Subcommittee investigations that speculation has an impact. I don't think there is much argument over that. The question is how much impact, but it has an impact.

Let me just kind of step back a little so we are all operating on the same plane, because some of my colleagues have raised concerns about the Enron loophole. As I understand it, when we looked at Amaranth, the Enron loophole related to natural gas and ICE and not having the same transparency in the ICE market. In terms of oil, as I understand it, what we have seen with the charts of the Chairman,[1] at least in the NYMEX New York market, that is regulated, and ICE, as I understand it, has moved the oil trading off to London. So that is also regulated. So I want to make clear, does the Enron loophole impact the trading of oil? Any of the witnesses there?

Mr. GHEIT. Well, the ICE is actually the Intercontinental Crude Exchange and it is operated in London under the rules and regulation, but it is owned by a U.S. firm.

Senator COLEMAN. Right, but the Enron loophole, the problem we had with natural gas is that there was not transparency. They were not regulated. At least with, as I understand it, ICE now has moved off to London and then those are regulated by London. So in other words, I am always looking to see whether transparency is going to make a difference here. I am trying to understand what transparency is. A lot of my colleagues have talked about the Enron loophole, but that is not the situation with oil.

In terms of transparency, perhaps Dr. Verleger, what I got from you was an indication that perhaps we should require greater

[1] See Exhibits No. 1 and 3, which appear in the Appendix on pages 118 and 120 respectively.

transparency in bilateral swaps, and I can tell you in regard to natural gas, a lot of folks said that would be a terrible thing and that would have a terrible impact on getting capital in the marketplace, on the ability to hedge in a proper way. So are you advocating that we somehow regulate bilateral swaps and can you tell me how we do that?

Senator COLEMAN. Dr. Verleger.

Mr. KRAPELS. He is much better looking than I am.

Senator it is a critical question and it is kind of a lawyer's question, and I am not a lawyer but I will give it my best shot anyway. When Mr. Veleger and I were in Vienna a year ago and we were discussing this issue with the OPEC members and with the European Union members, they had the same questions that you have today and what do we do about it.

The issue of communication and harmonization of regulations between the United States and the United Kingdom is an important issue and I think the perfect world would be one in which both countries impose the same disclosure and margin requirements on all exchanges operating in the oil market. The British have their own views on this. I think it would be wonderful for the U.S. Government to reach out to the British Government and see if that kind of harmonization could occur.

The fear that if the U.K. and Britain somehow teamed up and had effective regulation of this market, that the markets might go somewhere else, like Singapore, is a risk I would be willing to take, because the only places these markets can really work is in London and New York.

Mr. VERLEGER. You said U.K. and Britain. Do you mean the U.K.——

Mr. KRAPELS. I am sorry, the U.K. and the United States.

Mr. VERLEGER. I think it is key in looking at this, is transparency. Position limits are also important. If you read the Amaranth report, the ability of Amaranth to act was limited—NYMEX was watching them. They moved their business off to the ICE. It has always been important in terms of commodity markets to have some sort of position limits and exemptions. Now, I spent a long time taking apart the collapse of Metall Gesselshaft for their side and they managed to skirt around the position limits and their actions actually depressed the price of crude oil through their trading by about $8 a barrel in 1993 to 1994.

So as you look at this, it is position limits, oversight by these regulatory bodies, and NYMEX does a great job, and the NYMEX is losing business because of this movement. So the harmonization. Those two requirements, because the light of day, that is what Enron didn't want, and just getting those things would take us a long way.

Senator COLEMAN. It is your testimony that I think I heard about regulating bilateral swaps. I have a question with transparency for Dr. Verleger. Again, though, understanding position limits, understanding transparency, which you have in the NYMEX, you have somewhat in the London exchange, are you advocating that somehow there should be greater regulation of bilateral swaps?

Mr. KRAPELS. Well, the ICE exchange by nature is a derivatives market and I think you can probably apply some sort of filter that says below a certain volume level, you do not need to regulate. But when you have these central core contracts like WTI and rehub [ph.], those, I think, should be fully disclosed.

Senator COLEMAN. And then the last thing is Dr. Verleger raised a very ominous prospect about continuing to put sweet crude in the SPR. Would it make a difference, then, if regulation were changed so that we could use sour crude? Would that somehow diminish the ominous forecast that you have provided?

You responded to Mr. Caruso's concern about Nigeria by saying, well, that goes to a different market. My sense in oil is that these markets are malleable, unlike gas where there are different markets. Wouldn't you admit that oil markets are not focused here or focused there? Ahmadinejad does well, whether we buy it from Iran or not.

Mr. VERLEGER. Well, there are two things. One, in a future hearing, you are going to talk about the way the Chinese are lining up some supplies. There are at least 400 different types of crude. A number of these crude streams are, in fact, locked up under long-term contracts. That is, the oil will go to specific consumers, like the Algerian crude tends to all go to Italy. The price is set off the market. It used to be there were official prices. It is now tied to WTI or to Brent or to Dubai. But diverting the oil to a different source is hard. I went through and I tried to trace out where some of this Nigerian crude is going and I just, frankly, don't know—forget which of the supplies got disrupted.

So yes, it is fungible to a certain point, but that gets back to the other thing. The reason light sweet crude is so valuable is that we have now gone to these very tight environmental specifications and so refiners can take the three-tenths percent sulfur crude and run it through a unit and it doesn't slow down the desulfurization units.

The IEA has written several studies in their Monthly Oil Market Report that worldwide in Europe and now the United States, refinery utilization rates are going down because of these new desulfurization rules. The units don't work as well. Tesoro just last week reported they are having longer delays, and the long-term experience in California and the West Coast where we have had lower sulfur requirements is that we lose three percentage points of operation.

In these circumstances, what I understand from people who run refineries, and in one way it is saying it is making sausage, except it is toxic, but it is that the light sweet crude is just very valuable because it bypasses these critical units and so it has become much more important.

Now, I have read EPA's rulings and I have read the DOE studies on what the low-sulfur diesel rules were going to do, but nobody has gone back and asked the question, in fact, has shifting to this essentially pure diesel fuel led to a reduction in the rate of refinery operation rates and has that contributed to the price increase. One of my good friends who is a politician says it is not a question we want to ask because the answer is not going to be helpful. But that is the nature of the problem.

So to answer your question, we have SPR facilities that have heavy sour crude and we have them that hold sweet crude. I would sell off the sweet crude and fill them with sour crude. In an emergency, if we really have to replace the crude, we can relax the environmental standards the way we did in Hurricane Katrina. I think there is a likely probability that we would be dealing with a much lower price of crude.

Senator COLEMAN. Thank you. Thank you, Mr. Chairman.

Senator LEVIN. Thank you very much. Senator Murkowski.

Senator MURKOWSKI. Thank you, Mr. Chairman.

To follow up on this discussion about the sweet crude versus the sour crude, recognizing that it is the sweet crude that WTI looks to to set that price, and then the higher demand for this sweeter crude, is there an alternative benchmark that we could use, a suitable alternative to this sweet crude that might make a difference one way or the other?

Mr. VERLEGER. Actually, I ought to plead guilty. I was at Drexel Burnham that created the NYMEX crude contract in 1983, and the reason they picked NYMEX at the time was there were a number of suppliers and a larger number of buyers, and no market control. Cushing was the perfect place. There is a second one, Brent, that has been created. It is much harder because you don't have as many producers or consumers.

It is certainly possible now—Mars, a sour crude produced in the Gulf of Mexico, was not in production. There are other fields with larger production. The ideal would be a Middle East crude, but the Saudis have always refused to allow resale of their crude or sale of the crude on the open market. This essentially bars us from using something like that.

But yes, one could pick a crude. That chart,[1] presented by Senator Dorgan, showed the price of Saudi crude has not gone up as much as the price of light crude. It could be done. We didn't have financial settlements of futures contracts in 1983 as we do today. One could move to a financial settlement. One could use the large volumes now of much more sour crude coming south from Canada from the tar sands because there are a number of producers and their pipelines are being built to bring them down. So there are substitutes and you could move the market.

Senator MURKOWSKI. It seems to me that since 1983, we have seen a great deal of change. Mr. Gheit, do you want to comment on that?

Mr. GHEIT. Just to explain why WTI has moved up faster than any other type of crude and didn't come down. One of the reasons that you have unprecedented shutdown or unexpected shutdown in refinery capacity over the last 7 or 8 months, or even longer. Whiting in Indiana and Dixon City were shut down a couple of years ago, and these refineries, their conversion unit which is able to take heavy sour crude, convert it into light product, which is really where that profit is, obviously could not operate because of the fire and explosion and everything else, so they had no other choice but to operate on pure light sweet crude. So the demand for light sweet crude obviously moved up very sharply. That is why you see the

[1] See Exhibit No. 8, which appears in the Appendix on page 129.

differentiation between the oil coming from Canada and the WTI increased almost $30, $40 per barrel over the last few weeks.

But the idea for us to increase the buying of light sweet crude into the SPR also sends the wrong message to the world and to the traders that we could be facing potential supply disruption. We are just sending the wrong message to the world market, saying that we are worried about the future availability of crude oil. That is why we have 700 million barrels of crude oil inventory, or SPR, but we want to increase it even more.

So as I said, traders will take anything that they can get their hands on to exploit the situation, to make profit, to exaggerate the situation. A pipeline was shut down a couple of weeks ago, and before you know it, obviously, the traders in London spiked the price before we get into the office. I walked into my office and all of a sudden, what happened overnight? Well, there was an explosion. Everybody said there is going to be $100 oil or whatever. The fact of the matter, it was repaired in no time, but this is after the fact. They already made the money. The whole idea is that they amplify the bad news because——

Senator MURKOWSKI. How much does the fear factor really factor into the speculation, then?

Mr. GHEIT. I personally believe that there is at least a $30, $35 premium in oil prices as we speak. One of the reasons is that nothing has changed in the physical supply and demand since August of this year, yet oil prices moved up by almost 50 percent.

Senator MURKOWSKI. It has gone——

Mr. GHEIT. Yes. Everything else is equal. China is going. We have winter, we have summer. We have driving, we have seasons, we have everything. Nothing was new, in my view. Everything else is equal, and all of a sudden, oil prices went from $65 to almost $98. There was no justification for it.

Senator MURKOWSKI. Thank you, Mr. Chairman.

Senator LEVIN. Thank you very much, Senator Murkowski.

I think I will, unless it makes a difference, I will go back and forth now if that will be all right. Senator Wyden.

Senator WYDEN. Thank you, Mr. Chairman.

Mr. Caruso, you run the lead Federal agency for analyzing information about energy prices and supply, and yet, as you have in the past, which is why I started the discussion an hour ago about you all, you have again told the Subcommittee that speculation is not a serious problem and it doesn't warrant a serious response. I disagree profoundly with it, and obviously my colleagues do, as well. So let me get into a few of the specific issues and have you tell me whether you think it is in the public interest to know information about areas I think are important.

With respect to physical inventory, and you all issue these reports, you put them out, there are millions and millions of barrels of oil sitting in storage now. Do you think it is important for the public to know who the large holders are of those barrels of oil?

Mr. CARUSO. Yes, I think that is public information. I mean, the owners of inventories are the big oil companies. We don't publish them by company. That is confidential. But the fact that those companies are——

Senator WYDEN. That is what I am asking for. I think that the public ought to have a right to know who the large holders are. I don't know of anywhere where people can get that information. Are you saying that there is somewhere where I can get that information?

Mr. CARUSO. We do not publish it because we——

Senator WYDEN. But I asked you——

Mr. CARUSO [continuing]. We collect it on a pledge of confidentiality.

Senator WYDEN. But do you think it is in the interest? Is it in the public interest for our people to know who are the large holders? I do, because I think it goes right to the heart of being able to track speculative activity here. I mean, this is not a question of price controls or somebody introducing legislation. It is a question of information that I think people ought to have. But you don't think it is something you ought to be doing?

Mr. CARUSO. We collected data on a pledge of confidentiality, based on statutes that established the EIA in 1977, as other statistical agencies do.

Senator WYDEN. Do you think you ought to make that information available to the Congress, because you have resisted——

Mr. CARUSO. We will do whatever is the law.

Senator WYDEN. You have resisted that in the past.

Mr. CARUSO. We comply with the law. There is a law.

Senator WYDEN. Do you think that ought to be done in the future?

Mr. CARUSO. I would leave that up to the policy makers——

Senator WYDEN. But I am asking you because you are the person who right now is on the front lines of collecting information about speculative practices when people like Lee Raymond are coming in here and telling us it is a very significant factor. Do you think that kind of information ought to be made available to the Congress so that the Congress can make judgments in this area? Yes or no?

Mr. CARUSO. From a statistical point of view, no, because it would——

Senator WYDEN. Thank you.

Mr. CARUSO [continuing]. Stifle the data collection.

Senator WYDEN. OK. Then let me ask you about the relationship of CFTC to the role that I think you ought to be performing, which is to be looking, for example, at large holders in matters that go to speculation. Now, the CFTC has issued a variety of announcements recently—a million dollar settlement penalty against Marathon Oil, the settlement penalty against a former British Petroleum gasoline trader, and Amaranth. We are talking about a variety of these different settlements. So what this all goes to is the manipulation of the very prices your organization is insisting can be explained by the laws of supply and demand. Why do you all think that you should sort of ignore these documented examples of market manipulation?

Mr. CARUSO. We don't ignore them. We work in cooperation with CFTC when those instances are required through the procedures that are already in place.

Senator WYDEN. Well, you don't collect large trader information on who is holding physical energy inventory. I mean, it seems to

me you say, well, some other people are taking action in this area, but you have got hundreds of people and you can't put a few people on this particular issue of looking at speculation?

Mr. CARUSO. This is the role of the CFTC and the Federal Trade Commission and others to provide oversight and enforcement. We are a data collection and analysis agency. I think the CFTC is doing its job.

Senator WYDEN. I just think for you to say, in effect, that it is not your job, even though you have come up to the Congress and said it is really market forces. I mean, Senator Levin asked you about that. I have asked you about it in the past. You have got it in your reports. You say this is really not a very serious thing. So you are making a conclusion, it is not a serious thing, but you won't put anybody on the question of actually analyzing what is going on in some areas like finding out who the large holders are. And I think that is a dereliction of what the lead Federal agency ought to be doing.

I am telling you, I am going to bird dog this until we change your agency's role on this. I think you are a decent fellow. We have talked about this in the past. But I think the agency is profoundly wrong with respect to sitting on the sidelines about speculation and I suspect, having listened to colleagues here this morning, we are going to have some allies as we try to get you all off——

Mr. CARUSO. I just want to clarify. I am not saying it is not a serious issue. It is a very serious issue.

Senator WYDEN. Chairman Levin had to ask you at least three times the question of whether you thought speculation was even a factor. You haven't—and that is why I quoted the reports. Do you want me to read them back to you? In 2006 and 2007, you said that it was not a serious problem, and you have dismissed it again. It is, and your agency is not doing what it ought to be doing in terms of collecting this information. I, for one, am going to stay at it until we get it.

Thank you, Mr. Chairman.

Senator LEVIN. Thank you. But you just said 20 seconds ago it is a serious problem.

Mr. CARUSO. No. I said we are not saying it is not a serious issue.

Senator LEVIN. It is a serious issue.

Mr. CARUSO. It is a serious issue that should be looked at by the appropriate——

Senator LEVIN. It is the first time we have heard you use the word "serious" relative to speculation, that is a serious issue. As often as a number of people have tried to get you to acknowledge that, you have been unwilling to say that.

Mr. CARUSO. Well, it may have been the different ways the question was worded. I am saying that the issue that is being discussed here, looking at the role of speculation in the market, is definitely a serious issue and I agree that it is the appropriate thing to be looked at by the Commodity Futures Trading Commission and others that are charged with oversight and enforcement.

Senator LEVIN. But not by you?

Mr. CARUSO. We look at it as one of the many factors in the oil market analysis——

Senator LEVIN. Thank you.

Mr. CARUSO. And that is the way I responded to your question. It is one of many factors.

Senator LEVIN. Thanks. Senator Collins.

Senator COLLINS. Thank you.

Mr. Caruso, current law requires the Department of Energy to evaluate the impact on markets when the SPR is being filled, and as a result of an amendment which Senator Levin authored in 2005 and I was his chief cosponsor, the law specifically says that decisions that the Department makes with regard to the Strategic Petroleum Reserve must be made to "avoid incurring excessive cost or appreciably affecting the price of petroleum products for consumers." So the law is very specific, yet you have testified today that those in charge of filling the reserve have not consulted with you on what the impact on prices would be. Is that correct?

Mr. CARUSO. That is correct. We have not been asked to analyze the impact of——

Let me just correct that. I was asked in late 2003 and we presented a memorandum to Secretary Abraham at that time.

Senator COLLINS. But as we have all pointed out, we have had a huge jump in oil prices in the last 6 months and yet the Department is continuing to fill the Strategic Petroleum Reserve, thus taking oil off the market. So I am left at a loss why you have not been asked by those responsible for making the decisions on when and whether to fill the reserve to make those purchases, that you have not been asked what the impact would be on consumer prices, on supplies, on inventories as the law specifically directs that to be taken into consideration. Do you believe the Department of Energy is complying with the law?

Mr. CARUSO. I would have to defer to, of course, the policy makers in the Department, but they have other analytical resources—such as the Office of Fossil Energy, which is where the Strategic Petroleum Reserve exists——

Senator COLLINS. But you have described yourself this morning as the agency that does data collection and analysis. Aren't you the logical agency within the Department for those making this decision to turn to?

Mr. CARUSO. Senator, as I indicated, we are certainly available to do what is required by the Administration or the Congress.

Senator COLLINS. Well, back when Secretary Abraham was in charge of the Department, you said you were asked what the impact would be, correct?

Mr. CARUSO. That was correct, in 2003, I believe.

Senator COLLINS. And you have not been asked since that time, despite the fact that we have had a huge spike in oil prices, which would suggest that it is the worst possible time to be buying oil for the reserve, is that correct?

Mr. CARUSO. I have not had any formal request to do that.

Senator COLLINS. Mr. Chairman, I hope this is an issue that we can pursue, because it seems evident to me that the Department is not complying with the law that you wrote and I was pleased to be your principal cosponsor. The law is very explicit on what the standards are, and yet it appears that the Department is not even making the analysis necessary. So I look forward to——

Senator LEVIN. In that regard, why don't we do this, Senator Collins, and thank you for pointing this out. We are going to ask you, Mr. Caruso, to ask the policy makers at the Department of Energy why it is that they have not consulted with you and whether or not they have complied with the provision that Senator Collins has identified which is law, and if not, why not, and report back to these two Subcommittees. Will you do that?

Mr. CARUSO. Yes, Senator.

Senator LEVIN. Thank you.

Senator COLLINS. May I ask one quick question?

Senator LEVIN. Yes.

Senator COLLINS. Dr. Verleger, I very much appreciated your testimony on the Strategic Petroleum Reserve because I, too, believe that was a factor that we can influence that has the potential to affect prices. You say in your testimony that the current oil price increase has not been spurred by speculation, and I just want to make sure I am understanding your testimony. It seems that you and Dr. Krapels have come to different conclusions, is that correct?

Mr. VERLEGER. I am not exactly sure where Mr. Krapels is on that. One of the problems, as the CFTC noted in its paper on large trader activities, it is very easy to look at the same data and reach two different conclusions.

What I have observed since August 18—I think I first followed this data in an academic article in 1985—a couple of things have happened. One is we have a financial crisis and as part of that financial crisis, we have seen people look for any sort of asset that is liquid that they can price, like the Special Investment Vehicles (SIVs), and so on. So to a certain extent, I think there has been downward pressure on prices. I think we will learn later when we get the data there is downward pressure on prices from speculators as financial organizations scramble for liquidity. This is something that Charles Kindleberger wrote about in "Manics, Panics, and Crises" years ago and is something many of my classmates at MIT have studied and I have been following.

As I said, we have had this very big price increase and this is—speculation just doesn't fit with this right now because the people who were long oil or were long physical assets are desperate for cash and they are going to Treasury bills. So I think in this cycle, this particular time, I don't think we are going to find it is speculation that did it.

There are pension funds that are buying assets, and that is what Dr. Krapels and I were talking about in Vienna, and those pension funds have continued to buy assets. Harvard has bought assets, and so on. They view those as a better return than, say, buying Exxon stock, and it is perfectly legitimate. That is not speculation. These are people who own stock and stay in that asset for long periods of time. They may have to roll their futures positions every month. They may choose to buy oil and then just every month replace the futures contract. But that is not speculation. That is investment and that is a new form of speculation.

Senator COLLINS. Thank you. Dr. Krapels.

Mr. KRAPELS. I completely agree with Mr. Veleger. I don't think we are in a different position here and I think the use of the word speculation tends to narrow the discussion. When a pension fund

decides to buy a lot of oil contracts as an ongoing strategic acquisition of assets and intends to hold those contracts for years and years and just simply rolls them over, is that speculation? It is, but it is not a speculative organization that is doing it because it is likely representing people that you wouldn't typically associate with speculation.

So one of the things I tried to share with you in my written testimony is that there are four or five different types of financial entities engaging in this market. It has created a hyper-sensitive situation. If delta hedging is having the effects that Mr. Velerger describes, then what we really have here is just a hyper-sensitive market created by the very size of the positions that hedgers and speculators constantly deal with.

Senator COLLINS. Thank you. I think your final comments show how difficult this issue is. I am convinced that we do need better oversight, much more transparency. I think that is absolutely key. And exactly how to draft this legislation, I think is going to be a real challenge to us, and yet I think something needs to be done. Thank you for your testimony. Thank you, Mr. Chairman.

Mr. KRAPELS. Thank you.

Senator LEVIN. And we will have another round now of questions.

Dr. Verleger, you indicated in this cycle, you didn't think that speculation was the cause of the jump. In the previous cycle, 1 year earlier, I believe you did feel that in that cycle, as I remember, $20 of the $70 price of oil in that cycle you felt could be attributed to speculation. You are not saying, as I understand it, that it is not that speculation doesn't impact prices, it is just that in this particular cycle, you don't see that is the cause of this particular increase?

Mr. VERLEGER. I would have to go back. I think one of the things Mr. Krapels and I say is that when we first started looking at this, we both had color in our hair. I think if you read the history of agriculture and so on, speculation always gets more credit than it deserves. I think at one point, $20 was done a couple years ago.

Senator LEVIN. Let us be clear. Twenty dollars was on a $70 barrel?

Mr. VERLEGER. When the price got up to $70, yes.

Senator LEVIN. That was your feeling at that time?

Mr. VERLEGER. That was the feeling at the time. I probably wouldn't say it again today. I think if I looked at it, I would come to a different conclusion.

Part of it is, as Dr. Krapels has just pointed out, commodity—what we have had is a move into commodities as an asset class. That started in 1990. I refer to a paper by two Yale and Penn academics, but there have been a series of them, and it took—very little money came for years and then a lot of cash started coming in around 2004 and some of that got seen as speculation. But essentially what it did was these firms would buy oil, buy other commodities. It is a diversified portfolio that they follow, and they follow a very rigid set of rules.

From 2004 to 2006, we benefited because that converted backwardation to contango and that promoted inventory building, so that a year ago, Morgan Stanley was holding a great deal of heat-

ing oil in New York Harbor and earning a good return on this. This is how Cargill became famous. They buy at $20 and you sell forward in the futures market to $40 and earn a return of, if that is a year, 100 percent. Those inventories were available last winter and so they reduced the price of heating oil in Maine and Minnesota and they reduced the price of crude oil. The investors lost money because of the way they were structuring their instruments and they have changed that. And I think I picked up some of that was speculation.

Senator LEVIN. All right. Let me go back to you, Mr. Caruso. In your Energy Information Administration report, which I have quoted before, you said that the role of these non-commercial future market participants in recent price developments is "difficult to assess." But then you say general principles favor a focus on fundamentals rather than consideration of alternative price drivers. You are saying that the reason you are not assessing them is because it is difficult.

Mr. CARUSO. It is difficult to actually get at a specific——

Senator LEVIN. But now you are saying——

Mr. CARUSO [continuing]. A specific number, let us say—you just asked Mr. Veleger, $20 out of the $70.

Senator LEVIN. Right.

Mr. CARUSO. What we are saying is that we do not believe it is possible to actually pinpoint the dollar amount that is related to speculation.

Senator LEVIN. But what troubles me is that here in this report you are saying it is difficult to assess.

Mr. CARUSO. Yes.

Senator LEVIN. Here, you are telling us it is someone else's job to assess it, not yours. You said CFTC assesses it.

Mr. CARUSO. No. I am saying that when one looks at what is the impact of speculation on the marketplace, there are other——

Senator LEVIN. Of course. We all agree to that. It is not the only factor. It is one of many factors.

Mr. CARUSO. Yes.

Senator LEVIN. Since it has been such an increase, a huge increase in speculation, we have asked you to assess it. Here you are saying it is difficult in your report. Therefore, you will look at more fundamental things.

Mr. CARUSO. Yes. Our assessment——

Senator LEVIN. Yet you tell us today, well, someone else is assessing it, CFTC.

Mr. CARUSO. What I am saying is that our assessment is that we can explain most of the price increase through fundamentals and the other factors that are listed there. I won't go into all the factors again.

Senator LEVIN. Right.

Mr. CARUSO. But when one looks at whether manipulation is the cause of the price increase——

Senator LEVIN. Let us try speculation.

Mr. CARUSO. There are studies out there, such as by the CFTC, the IMF, your own Committee, that we look at, and after looking at all of the available evidence, our assessment is that we can ex-

plain most of the price increase through the fundamentals and the other geopolitical and political factors that are listed there.

Senator LEVIN. Right, but we are interested in the part that is not explainable that way and we are asking you to——

Mr. CARUSO. We think it is very small.

Senator LEVIN [continuing]. To do your job.

Mr. CARUSO. We think it is very small.

Senator LEVIN. To do your job.

Mr. CARUSO. And we say——

Senator LEVIN. But I thought it was difficult to assess. Now you are saying it is very small. It sounds like you have assessed it.

Mr. CARUSO. It is difficult to assess, and after doing our assessment of the fundamentals, most of it can be explained by those factors, those fundamental factors.

Senator LEVIN. Is it CFTC's job to analyze the causes of oil price increases or decreases? Is that their job——

Mr. CARUSO. No.

Senator LEVIN [continuing]. Or is it yours?

Mr. CARUSO. No. That is our job, and I have given you our best assessment of that.

Senator LEVIN. Your best assessment was that you pointed to someone else's assessment. That is what you told us this morning.

Mr. CARUSO. No.

Senator LEVIN. I just want to get back to——

Mr. CARUSO. That is not what I said this morning.

Senator LEVIN. OK. We will let the record speak for itself.

Mr. Gheit, you have heard Mr. Caruso here this morning. Do you have any reaction to the Energy Information Administration's position as to whether or not speculation is a significant factor in the price increase or not and whether or not they are pursuing carrying out their responsibility and giving us an assessment?

Mr. GHEIT. Well, what I heard is that it is very difficult to estimate or assess, and then I also heard it is very little. That means that there is a conclusion that it is not big enough, so——

Senator LEVIN. That it is not very big?

Mr. GHEIT. Yes. On one hand, we said it is very difficult to assess. On the other hand, we are saying it is small. Either it is difficult to assess and I don't know exactly what it is, or it is very small and I did my homework and I can tell you that it is small.

Senator LEVIN. And now when you have given us your opinion this morning about this is a significant cause of the recent major jump, 100 percent increase in the price of oil, are there studies that you point to, or is that based on experience?

Mr. GHEIT. It is, as I said before, I have been in this business 30 years. I have seen cycles and this is another cycle. This is an oil bubble. It is a classic case of oil bubble. You talk to people in OPEC, they cannot explain it. You talk to people in the industry, they cannot explain it. The speculators know the number of contracts outstanding. When people say oil prices are going to go up this Friday because of the expiration date, that has nothing to do with supply and demand fundamentals. That is the flow of paper coming into somebody's desk and just pushing a button and saying, buy me more or buy me less. So it has nothing to do—basically, we

have a disconnection between the physical market and the financial market.

Senator LEVIN. OK. Let me call on Senator Murkowski and I will come back. Thank you. Senator Murkowski.

Senator MURKOWSKI. Thank you, Mr. Chairman.

I think if I listen or try to read between the lines here that everyone is at least in agreement that when you have tight supplies, it can lead to speculation, which can ultimately lead to the manipulation that we are all concerned about here. So I want to talk just a minute about the supply, the inventory aspect, and Mr. Caruso, you mentioned in your testimony, you stated that OPEC has altered the targets over the years. Do you think that OPEC has purposely created an inventory tightness and continues to keep its production at levels that deprive the markets of our ability to build inventories?

Mr. CARUSO. I think it was definitely their goal when they reduced quotas late in 2006 and the beginning of 2007. There were two reductions of OPEC targeted production levels, in the fall of 2006 and another one in the early part of 2007, mainly because they saw that inventories in the United States and other OECD countries were relatively high relative to the 5-year average and they saw prices coming down. In the latter part of 2006 and the beginning of 2007, prices had gotten into the $50 to $60 range. This clearly was, in OPEC's view, a price that they would like to have seen increased, and that is why they reduced production. From the period of the fourth quarter of 2006 through the third quarter of 2007, OPEC production was reduced by about 800,000 barrels a day, leading to lower inventories and a tight, very tight market leading, we believe, to most of the price increase.

Senator MURKOWSKI. In the aftermath of Hurricane Katrina, we know that there were refineries that were offline and we know that there were wells in production that were taken off at that time. Are we at 100 percent now after Hurricane Katrina in terms of those wells that were producing prior to? Are we missing anything domestically then in terms of our ability to produce domestically?

Mr. CARUSO. Well, the oil and gas production in the Gulf of Mexico is increasing, but it is still below the level that would have been expected had the major hurricanes not occurred.

Senator MURKOWSKI. But is everything online?

Mr. CARUSO. We are a bit below. Some decisions were made not to bring certain wells and other facilities back online because the cost was believed to have been prohibitive given the revenues that could be earned by bringing that back online. The cost-benefit decision was made to leave some of that production offline and it delayed the new production in some fields, including Thunderhorse, which, of course, was damaged by the hurricane directly.

Senator MURKOWSKI. But in terms of significant amounts, would you describe that as being significant to what we are seeing in our inventories now?

Mr. CARUSO. I would say it was important, but clearly not nearly a major driver—about one to two hundred thousand barrels per day lower than it would have been.

Senator MURKOWSKI. Let me ask you a little bit different tact here. This was in your written testimony and you also mentioned

briefly in your oral testimony here the impact of the U.S. dollar, recognizing that we are seeing a decline there, adding to continued oil consumption because oil is trading in U.S. dollars, making the increase in the price of oil less severe on foreign economies. Is it likely that oil prices might move from dollar pricing to being based on some other currency? I know that this was discussed in some recent OPEC meetings. You look at European nations, you look at Japan with very strong currencies of their own. Is that price of oil affecting them as we are seeing here? Just give me a little discussion on whether or not we will continue the direction that we are currently on in terms of the oil pricing.

Mr. CARUSO. The appreciation of other currencies relative to the dollar has meant that the costs to consumers in the Euro zone, in the yen in Japan and even in some other currencies, the full cost of the price increase is not being borne by the consumers in those areas. Therefore, it has contributed somewhat to an increase in demand because it is a lower real price. It has also contributed to, I believe, thinking in the discussions and the OPEC meetings that have been reported—that OPEC ministers have said their revenues, in effect, are buying less because of the purchasing power loss—and so it is certainly possible that is part of the decision-making process within OPEC, as well. Whether it would lead to a change in the way oil is priced, I continue to believe that it will not because so many of the assets held by OPEC countries are in dollar-denominated assets that it would be detrimental to their own assets.

Senator MURKOWSKI. Does anybody else disagree?

Mr. GHEIT. But also in OPEC, some of the countries have their own currency pegged to the dollar, and therefore when they have the revenue come in dollars and then they have to pay their costs with their foreign workers coming from Korea and elsewhere, these workers now are demanding to be paid either in Euro or their own country currency because the money they are sending home is really less than before because of the depreciation of the U.S. dollar. So there is tremendous pressure on OPEC.

I was in Dusseldorf last week and there was a TV interview with the Chilean oil minister who said that I wish we had known about the drop in the dollar. We would have thought about switching to another currency before the fact. But obviously, if you plot the dollar against the Euro, for example, it is down almost 40 percent in the last couple of years here. So you are going to see additional pressure, upward pressure on the oil price as a result of the decline in the U.S. dollar.

Senator MURKOWSKI. Thank you, Mr. Chairman. I have no more questions.

Senator LEVIN. Thank you. Let me get back to the NYMEX contract for a minute. We were talking, Senator Murkowski and others were talking about valid benchmarks and the benchmark which is used for the NYMEX price is the Cushing, Oklahoma price. Now, that price can be affected, I take it, when we are using sweet crude for the SPR. Dr. Verleger, that is basically the heart of your testimony, is it not?

Mr. VERLEGER. Yes. Now, when they say the NYMEX contract is the West Texas sweet crude, it is actually light sweet crude.

Senator LEVIN. Light sweet crude.

Mr. VERLEGER. There are a number of crude oils that can be delivered against the NYMEX contract and the list has changed over the years with the NYMEX to expand the deliverable. For example, a Brent could be delivered into Houston and then piped up. It has to be moved into Cushing unless an alternative delivery procedure is agreed to by both the long and the short. But there are a number of crudes and they are all kind of light sweet. Many of them are also on the list of sweet crudes that qualify for submission to the DOE's West Hackberry, where they keep sweet crude in the Strategic Petroleum Reserve.[1]

Senator LEVIN. Would it be wise for the SPR to use a greater percentage of non-sweet, I guess sour crude, in terms of price?

Mr. VERLEGER. That is in my testimony. Yes.

Senator LEVIN. That is the heart of your testimony?

Mr. VERLEGER. Yes, the heart of my testimony.

Senator LEVIN. All right. Now, Mr. Caruso, why is the DOE not doing that?

Mr. CARUSO. My understanding, as I am not in the policy making business, but my understanding is the way the crudes are chosen is to try to have the best mix that fits our refinery configurations in this country and that is what the Strategic Petroleum Reserve Office has used as a criteria for that.

Senator LEVIN. All right. So now Dr. Verleger——

Mr. VERLEGER. I was at Treasury when we created this in the 1970s. In the 1970s, we had a number of refineries that could only process sweet crude and so they developed a number of facilities. If you read the international energy programs, there are a number of different storage salt domes and we put sweet crude in those and that is 30 years ago.

Now, we have moved to a situation where more refiners can process heavier crudes. We also have gone to these very tight environmental specifications which could in an emergency be relaxed, as they were after Hurricane Katrina. And yet to my knowledge, there has been no study as to whether the mix of crudes we are putting into the reserve today is appropriate given today's refining standards.

Senator LEVIN. Or the capability of taking action if they are not perfectly reflective of refineries, then.

Mr. VERLEGER. Right. Yes.

Senator LEVIN. Either one.

Mr. VERLEGER. Yes. This is——

Senator LEVIN. Mr. Caruso, why doesn't the DOE make that change to save American consumers some money?

Mr. CARUSO. I am not aware why they have not. I do know that the current mix of fill is one-third light sweet and two-thirds heavy sour.

Senator LEVIN. We set in law, we know that, but that is apparently the way it has been for some time. Has it changed that mix?

Mr. VERLEGER. Well, next June, the material the Subcommittee staff provided me said that it is going to be two-thirds sweet crude, one-third sour crude in the first half of this next year.

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[1] See Exhibit No. 20a., which appears in the Appendix on page 208.

Senator LEVIN. Now, why is that being done?

Mr. CARUSO. I would have to answer that for the record because it is a decision made by the office within DOE that runs the Strategic Petroleum Reserve.

Senator LEVIN. Yes. Would you find that out?

Mr. CARUSO. Yes, sir, I will be happy to.

Senator LEVIN. We have been pressing this point. We have a law which says that you have got to fill the reserve in a way that minimizes the cost. It looks to me like the DOE is ignoring the law, as Senator Collins pointed out, but also ignoring the pocketbook of Americans. This is a reserve. This isn't oil that we are going to have to refine. It is oil that someday we may have to refine, and we may have to waive environmental laws to refine it. But if an emergency is such that we have to take oil out of the reserve, why would the DOE ignore the law, but ignore the pocketbooks of Americans?

Mr. CARUSO. I will take that question back to the Department, Senator.[1]

Senator LEVIN. There is a chart that is up there.[2] This is the price of oil at Cushing and this shows the relationship, at least at Cushing, of supply and demand, and we show here that when the demand goes up and when the supply goes down, the price goes up. It relates inventories to price. Mr. Caruso, can you see that chart?

Mr. CARUSO. Yes, sir.

Senator LEVIN. Does it make sense for us to be decreasing the supply at Cushing of sweet crude by putting that sweet crude in the SPR when the direct effect of what we are doing is increasing the price at Cushing, Oklahoma, which has a direct impact on the NYMEX price, which has a direct impact on future contracts? Does that make sense to you, or do you disagree with that?

Mr. CARUSO. Well, the facts are the facts. I mean, those are the facts that are on the chart. I don't disagree with the facts of the——

Senator LEVIN. You believe that supply and demand is the thing that is the most controlling in terms of the cost of oil. We have argued this morning about ignoring the impact of speculation. But here at one location where there is not speculation, there is direct supply and direct demand, we see the relationship of price to supply. You are a big believer in that as being the cause instead of speculation in the general market. Why in the name of heaven would the DOE not follow the law to reduce that cost to Americans? Why would it want to increase the price of oil at Cushing, Oklahoma?

I know you are going to take it for the record. You are an expert at this. You make assessments of energy prices. Can you give us any idea from your perspective why they would do that?

Mr. CARUSO. Well, obviously, a decision was made based on a number of factors——

Senator LEVIN. But why would that decision be made? Do you know? Do you have any idea?

Mr. CARUSO. I can't answer that question.

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[1] See Exhibit No. 20b., which appears in the Appendix on page 209.

[2] See Exhibit No. 4, which appears in the Appendix on page 121.

Senator LEVIN. We will get off that. Senator Murkowski.

Senator MURKOWSKI. Go ahead, Mr. Chairman. I am finished with my questions.

Senator LEVIN. OK. All right. Should we, and I can ask all of you or most of you this question, should we encourage the NYMEX—which does a terrific job, I think most people concede—should we encourage them to broaden what their benchmark is? This is something also Senator Murkowski asked. Should we encourage them to not just look at Cushing, Oklahoma, but broaden it? I guess the main determiner of that price, which has got such a huge impact on the future contract prices, is Cushing, Oklahoma. Dr. Krapels, let me start with you.

Mr. KRAPELS. Creating a successful futures market is really difficult, and I think they have tried again and again and again to create a benchmark sour crude contract and have failed. There is simply that alchemy that they have somehow got the WTI to get working in the 1980s has never repeated itself in any other crude contract other than Brent, which looks like and smells like WTI.

I am not sure Mr. Veleger would agree with this, but there has recently been an effort to create a sour crude futures market in the Middle East. I don't think it is going to succeed. The reasons for it, we would probably need a whole new set of hearings to discuss it. It is extremely difficult to create a successful futures market.

Senator LEVIN. A different benchmark.

Mr. VERLEGER. I agree.

Senator LEVIN. All right.

Mr. VERLEGER. But part of it is a delivery location. Futures markets work best when you have a number of producers and a number of consumers and there is really no choke point, and Cushing is unique in that it is where a number of pipelines come together and there were a number of storage companies, and since NYMEX has been there, they have built more tanks.

I think that there is some hope as pipeline reversals are finished and sour crudes are coming down from Canada, one may be able to move it, move and create a contract tied to the Alberta contracts. The big problem, though, is that you have so much financial interest now tied. You now have over 2 million NYMEX plus ICE lookalike contracts, and that is just momentum and that is just—one of the things they will tell you if you are marketing futures contracts is the first exchange to be successful wins.

Senator LEVIN. Would it be possible to broaden the delivery points? Isn't that what you were suggesting?

Mr. VERLEGER. I was going to change the kind of crude——

Senator LEVIN. Well, we can't change the crude.

Mr. VERLEGER. Well, no, if you deliver south so you could change it to a sour contract in Cushing, which would change things. There are a number of delivery points available on this.

The other thing is to go to a cash-settled contract. Brent is cash settled with no delivery point, and it wouldn't have worked in 1983 because no one believed energy was a commodity. Now, that is not a problem, so you could go to a cash-settled contract off of a series of indices and that would work very well and that would take some of the distortions that were identified here out.

Senator LEVIN. Let me go back to you, Dr. Gheit. You make reference in your testimony to raising the current margin requirement. What is the current margin requirement for these contracts?

Mr. GHEIT. It is all over the lot. The trends are about 8 to 12 percent.

Senator LEVIN. Eight to 12 percent?

Mr. GHEIT. Right.

Senator LEVIN. And what is the margin requirement for stock that the SEC has set?

Mr. GHEIT. Fifty percent.

Senator LEVIN. Fifty percent for stock?

Mr. GHEIT. Right.

Senator LEVIN. This is 8 to 12 percent here.

Mr. GHEIT. Correct.

Senator LEVIN. Does that affect the amount of speculation?

Mr. GHEIT. Absolutely. What we are trying to do here is to slow down the traffic and to put a speed limit, because we don't want people to get hurt. We are not saying that we should block the traffic. We should allow it to proceed, but in a safe manner——

Senator LEVIN. Now, the stock market has a lot of traffic, does it not?

Mr. GHEIT. Absolutely.

Senator LEVIN. Even though it has got a margin requirement.

Mr. GHEIT. Absolutely.

Senator LEVIN. So we don't want to—we obviously want to have some traffic, as you say, Mr. Gheit. Would you have a problem, Dr. Krapels, with increasing the margin requirements?

Mr. KRAPELS. I would not. I think it is an overdue idea.

Senator LEVIN. Could you comment on that?

Mr. KRAPELS. Well, I think for exactly the reasons Mr. Gheit has mentioned. We tend to get over-leveraged in these markets. Big traders, especially speculative hedge funds, using the amount of leverage that they use, it magnifies their impact on price. I am not sure 50 percent is the right number, but something well north of where we are right now seems to me like good public policy.

Senator LEVIN. Anyone else?

Mr. VERLEGER. It seems to me that both Mr. Krapels and Mr. Gheit are right. The one point to add is that all these passive investors that are coming in that have bought into this market essential have a 100 percent margin because they set aside, when they buy a commodity contract, they set aside. So the liquidity is there in the market already, and I think in terms of reducing speculation, there is a longstanding history in financial markets where you raise the margins and you reduce the speculation. Whether it changes the behavior of prices, I am not sure.

Senator LEVIN. OK.

Mr. GHEIT. But also if we change, if the dynamics were to switch into other types of crude, I do believe that will have a negative impact on WTI and will just pull it down sharply. We need to burst the bubble. Whether it is going to come from economic slowdown or government action, but I feel that this is like 24/7 open gambling hole that people are saying that nobody will get hurt, but with the subprime, that with the S&L and all these things, a lot of people

were saying it is going to be a win/win. There will be no casualties here.

The fact of the matter, it is different and I don't believe that this party will last forever. It will come to an end, and I think the sooner the better, because the longer it stays, it is really going to distort and disrupt future capital spending, because right now, a lot of oil companies will end up throwing in the towel, believing that oil prices of $100 are here to stay, and they will make investment decisions that we will regret sooner or later. And that is obviously going to hurt the oil industry. It is going to hurt the supply-demand situation. So speculators are making money, but at a huge cost in the future to the economy, to the oil industry, to everybody. So a few people will make a lot of money at the expense of a very large number of people.

Senator LEVIN. Many Members of this panel believe in that very deeply, not all of us perhaps. I can't speak for anybody else, but it is obvious that many of us think that this speculation has run wild. The chart on the amount of speculation demonstrates it.[1] I think you all either think that speculation has an impact on prices, obviously, or clearly, or in the case of Mr. Caruso, a begrudging perhaps. But nonetheless, that has been the subject of this hearing today and——

Senator MURKOWSKI. Mr. Chairman, can I——

Senator LEVIN. Please. Senator Murkowski.

Senator MURKOWSKI. Before we wrap up, I am trying to get a better handle in my mind on how we define what a speculator is. You have a speculator that can affect prices and then you have a speculator that can manipulate prices. Tell me how we determine the difference, because I think it was you, Mr. Gheit, or maybe it was Dr. Krapels mentioned when we were talking about the pension funds and if you hold these for 20 years, is it speculation? Well, yes it is, but for a different purpose than one whose intent is to manipulate the markets. And I think this is where so many of my colleagues get so upset and pound the table and say, we need to do something about it, when we are actually manipulating the market. How do we define or make that distinction?

Mr. GHEIT. It is a very gray area. The speculation and manipulation go hand in hand. You are not going to get an oil trader coming on television saying that he thinks oil prices will go down. Why? They are intimate. Everybody is in it now. It is like if you can't beat them, join them. And it is almost a self-fulfilling prophecy. When somebody says oil prices will be $100 before the year end, everybody is pushing for oil prices to cross the $100 mark.

Senator MURKOWSKI. So are there any good speculators?

Mr. KRAPELS. There are many good speculators, and I think you have asked a pivotal question, Senator. I don't think you need to answer it. I think the one weakness of the report on Amaranth is that it is titled "Excessive Speculation." Now, there is a clear case for excessive speculation in the case of Amaranth, but it is so much on the margin of common practice that I think the solution to the problem that we are talking about, excessive volatility, tremendous hyper-sensitivity to prices, could be substantially addressed with

[1] See Exhibit No. 3, which appears in the Appendix on page 120.

higher margin requirements and much more information disclosure. If people knew what was going on, we wouldn't have the conspiracy theories that we have running around today. So a lot can be fixed just with those two elements of the law—of the proposals.

Senator LEVIN. Let me give the definition from the CFTC, and I happen to agree with what you have said about difficulties of defining, but this is what the effort is by the CFTC. A speculator does not produce or use the commodity, but risks his or her own capital trading futures in that commodity in the hopes of making a profit on price changes. So I think the key to it is someone who isn't producing or using a commodity, but it is somebody who is buying and selling a piece of paper with no intent to use or produce it, is that——

Mr. KRAPELS. But millions of our citizens do it, so——

Senator LEVIN. Of course. No.

Mr. VERLEGER. There is no difference, really, between my purchase of General Motors stock, because I don't intend to use or make General Motors products——

Senator LEVIN. But you do intend to keep it, the stock, presumably, unless you are——

Mr. VERLEGER. But I also have a passive investment through a fund in futures and they hold oil. Now, some of them hold oil in the ground and some just buy futures and they just hold claims on oil. It is a perfectly legitimate academic, or financial definition. They buy the oil and they just hold the position and then it matures, they sell the position because they have to and they take another long position. They stay steadily there. It is an investment. It is serving a very useful purpose because it promotes investment, and it doesn't cause this volatility.

Senator LEVIN. Let me ask a couple other of you about a couple other suggestions here of Mr. Gheit. Current margin requirements, you commented on that. Setting limits on the number of oil contracts by each account is another one of the suggestions at the end of your testimony, Mr. Gheit. Dr. Krapels.

Mr. KRAPELS. I absolutely agree. I think looking at not just the prompt month but the out months, as well, where Amaranth did a lot of its mischief. I think looking at the positions of individual traders as the CFTC does today, applying that to ICE and monitoring it and enforcing rules is part of what——

Senator LEVIN. OK, and Dr. Verleger?

Mr. VERLEGER. Absolutely.

Senator LEVIN. All right. So we have a third suggestion. Now, establishing a minimum holding period. Mr. Gheit suggested a minimum. This gets to the question of the teachers' pension funds or something. They intend to hold that for a while.

Mr. VERLEGER. They hold it. They roll the positions forward——

Senator LEVIN. But the fund that they are investing in doesn't intend to hold it for a particular period of time. They could buy and sell tomorrow or the next day constantly. But does that have as much appeal to either of you as it does to Mr. Gheit?

Mr. VERLEGER. The Goldman Sachs and the Dow Jones and these other funds actually continue holding it. Based on the number of dollars, they hold that number of contracts and they keep on holding it. The holding period, when I heard Mr. Gheit say it

the first time, I said, that is a good idea. The problem is that somebody who is speculating could take other offsetting positions. I think that is a regulation that is probably impossible to enforce.

Senator LEVIN. OK. Dr. Krapels.

Mr. KRAPELS. I agree.

Senator LEVIN. Now, preventing conflict of interest by financial institutions is another of Mr. Gheit's suggestions. Give us an example, if you would, of——

Mr. GHEIT. Well, basically have the dozen or so largest investment banks in the world, they are all involved heavily in oil trading. But they are also clearinghouses. They also make investments in their own account. So basically, they can see your cards, you don't see theirs, so they can see the traffic, whether it is going north or south, and they can put their money either with or ahead of the people who are putting orders through and they can manipulate the price the way they want to see it.

Senator LEVIN. With their own holdings?

Mr. GHEIT. With their own holdings, because they have a position. They can basically move the market their way if they want, and then it is in momentum and all of a sudden you see everybody doing the same. Their program changes. They are all the same.

But what I have noticed looking at what is happening, you read a statement in London and all of a sudden you see the reaction here in New York. It is almost fanning the flames. And again, a self-fulfilling prophecy. You say oil prices—one large investment bank not long ago said although we still think oil prices are still going to go higher, but we advise some of you might wish to take money off the table. Guess what? Oil prices dropped by $4 in 1 day. There was no change in supply and demand. The following day, oil prices regained the entire amount.

Senator LEVIN. OK. Dr. Krapels.

Mr. KRAPELS. No, I don't like that idea.

Senator LEVIN. OK.

Mr. VERLEGER. I don't like it. I think it is impractical——

Senator LEVIN. On the conflict of interest issue?

Mr. VERLEGER. Conflict of interest, yes. It is—not given the structure of our financial markets today.

Senator LEVIN. Can't do it, OK. The other one, stiff penalties on violators——

Mr. KRAPELS. Yes.

Senator LEVIN. I will leave that one go.

Thank you all. You have been a terrific panel. We appreciate it all. This has been a long hearing and we will stand adjourned.

[Whereupon, at 1 p.m., the Subcommittees were adjourned.]

APPENDIX

OPENING STATEMENT OF SENATOR JEFF BINGAMAN

I want to begin by thanking the witnesses, as well as Senators Levin and Dorgan for chairing today's joint subcommittee hearing. Today's session promises lively discussion on a topic we have been debating in Congress for a number of years now: whether increased speculation in financial energy markets is contributing to recent, record-setting oil prices.

Certainly, there is a broad recognition that—in the long-term—rising demand in developing economies such as China and India pose a challenge. Political uncertainties in oil producing regions of the world provide another source of grave concern.

But in addition to these factors, there have been a number of important developments in financial energy markets in recent years. These trends include a dramatic increase in the volume of trading in oil derivative markets, and the participation of new classes of traders in those markets.

According to a Government Accountability Office (GAO) report issued in October of this year, the average daily contract volume for crude oil traded on the New York Mercantile Exchange (NYMEX) increased by 90 percent between 2001 and 2006. Additionally, GAO noted that the average daily number of noncommercial participants in crude oil markets—including hedge funds and large institutional investors—more than doubled from 2003 to 2006.

Finally, there has also been an increasing amount of trading occurring outside of futures exchanges—characterized by former Federal Reserve Chairman Allen Greenspan (in testimony last year before the Senate Foreign Relations Committee) as "a major upsurge in over-the-counter trading of oil futures and other commodity derivatives."

Taken together, it seems to me that just as the demand for physical barrels of oil has grown with the global economy, there is an increasing demand for oil purely as a financial asset.

Untangling whether and how these dual sources of demand may be operating in concert—and potentially impacting oil prices--is certainly a complicated task. To my mind, it is a task made more difficult to the extent policymakers are confronted with a lack of reliable or comprehensive data across these markets.

As it relates to the fundamentals of the physical market, this includes a notable lack of reliable information with respect to global oil reserves. As for trading in oil and other energy-related derivatives, I remain troubled by the lack of transparency related to the over-the-counter markets.

It seems to me that markets operate best on the basis of complete and reliable information. In the absence of such information, I would suggest that the probability increases for prevailing market prices to become untethered from their fundamentals.

Today, we have a distinguished panel with us, and I think this hearing offers us an opportunity to more fully consider a number of these complicated issues. So again, I thank Senator Levin and Senator Dorgan, and look forward to the testimony of our witnesses.

OPENING STATEMENT OF SENATOR KEN SALAZAR

Thank you Chairman Dorgan and Chairman Levin as well as Ranking Members Murkowski and Coleman for holding today's joint hearing on crude oil markets. Today's hearing should shed light on the economic and market forces that determine the price of oil. Global demand for this resource grows stronger daily. Ensuring a rational and open crude oil market is a matter of national and economic security.

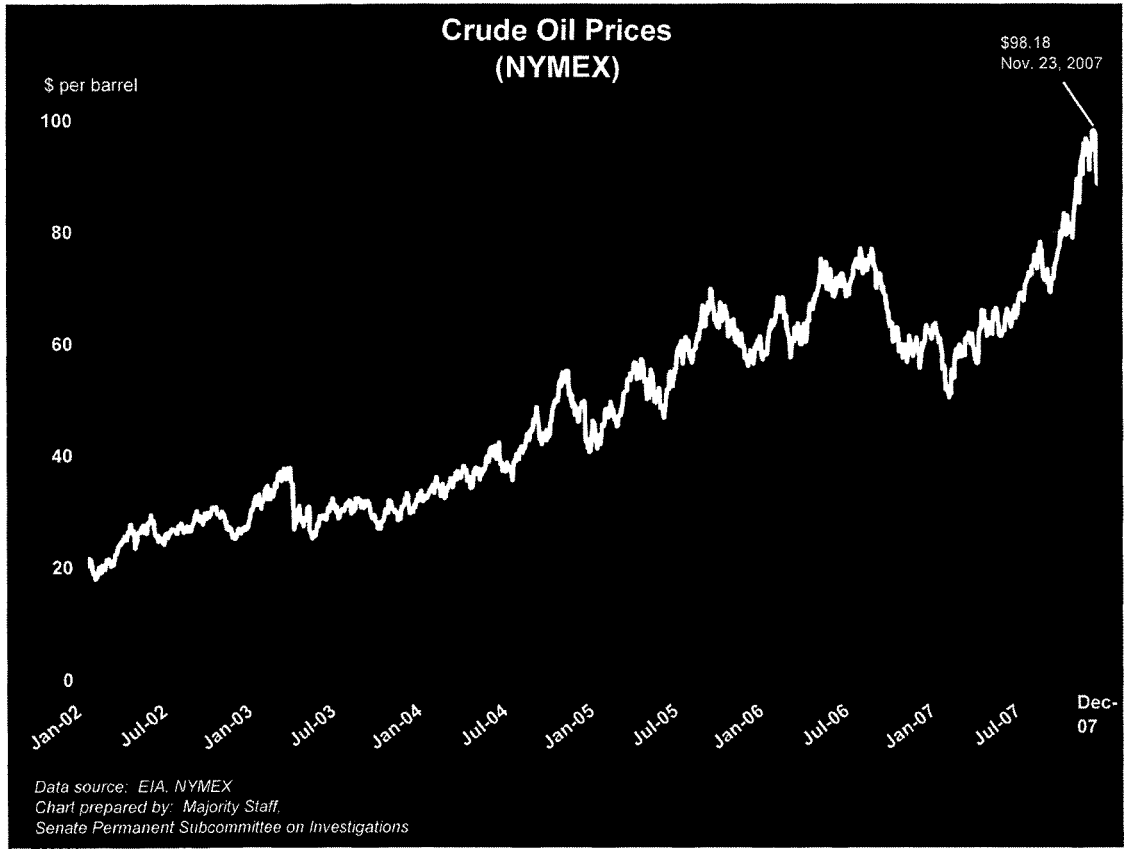
The Enron scandal provided us with an object lesson in the manipulation of electronic commodity exchanges, and I am sure that each member of our two Committees takes that lesson to heart.

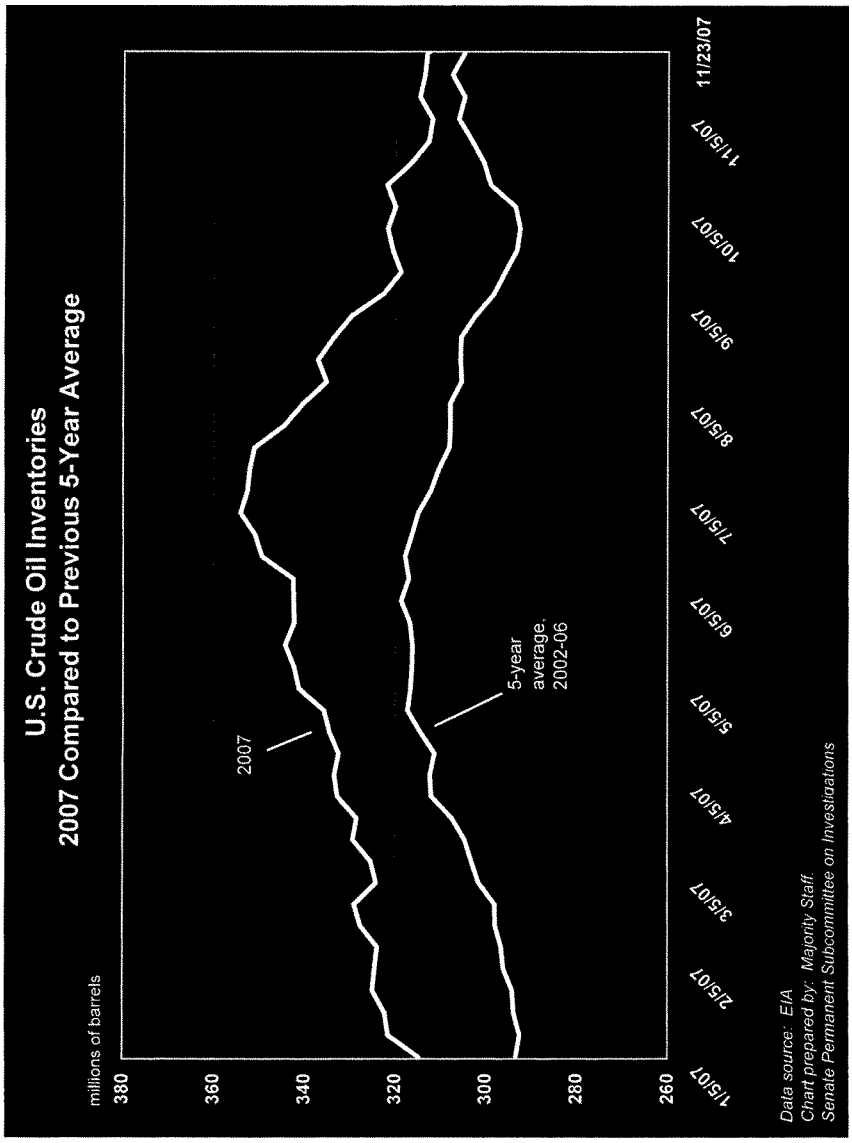
As oil nearly hit $100 a barrel recently, some analysts suggested that speculation in the crude oil market played a role in this price surge. Energy derivatives have become extremely popular as a financial tool, and have attracted numerous noncommercial entities into the crude oil market. Today we seek your views on whether these changes have made the market more vulnerable to manipulation.

Because of strong leadership from this Congress, our country is on the verge of a clean energy revolution. Our nation is extremely rich in renewable energy resources and I am hopeful that we will one day achieve true energy independence.

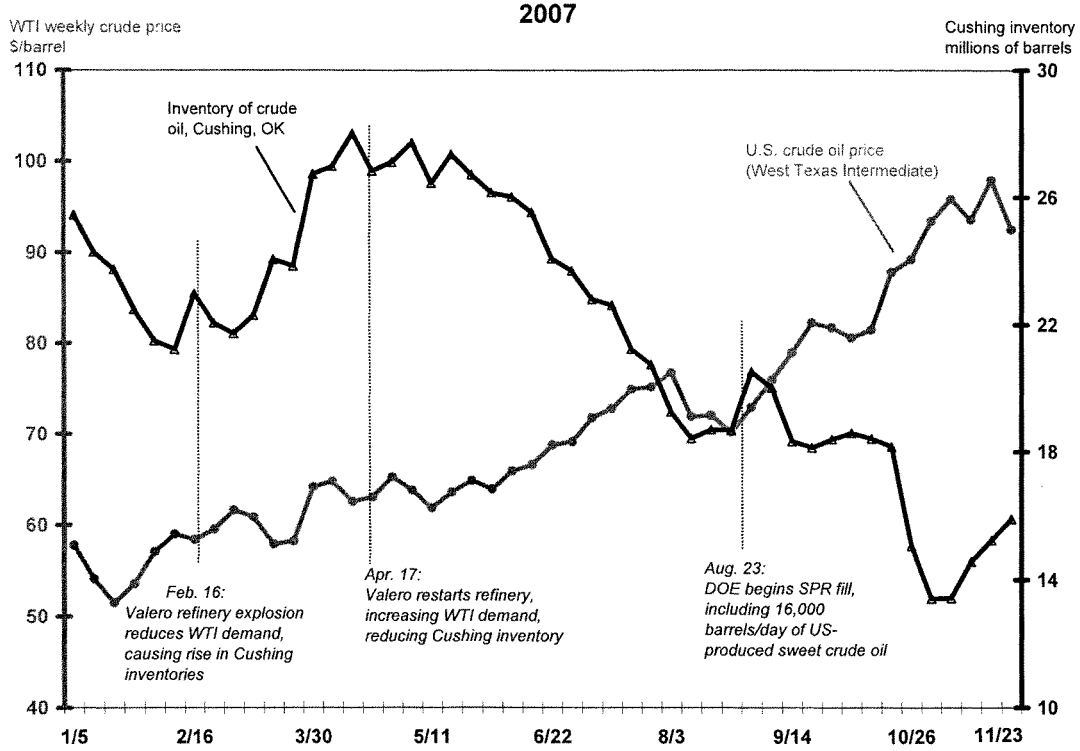
However, as we continue to rely on foreign oil in our transportation sector, it is imperative for us to understand the constraints we face in the marketplace. For this reason, I am pleased that this hearing was organized and I look forward to hearing the insight that our witnesses will share with us here today.

Thank you.

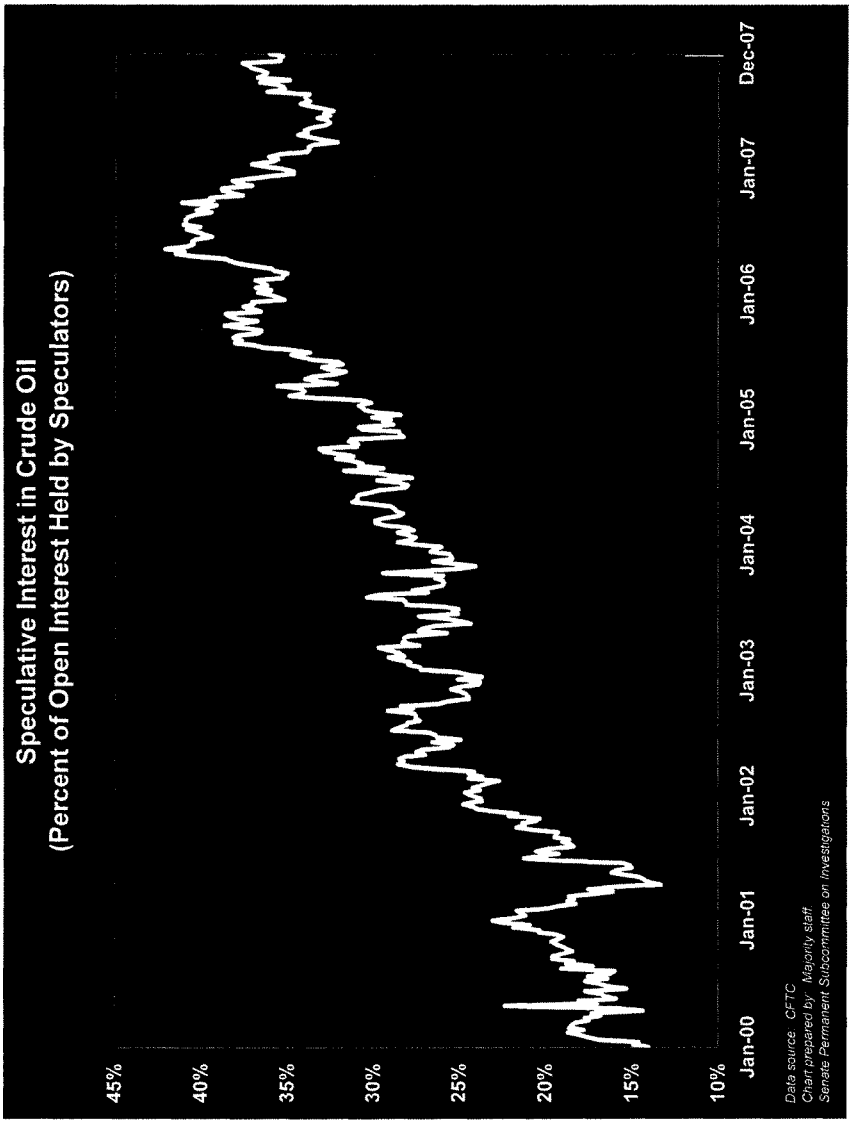

Crude Oil Prices
(NYMEX)
$ per barrel
100
80
60
40
20
0
$98.18
Nov. 23, 2007
Jan-02
Jul-02
Jan-03
Jul-03
Jan-04
Jul-04
Jan-05
Jul-05
Jan-06
Jul-06
Jan-07
Jul-07
Dec-07
Data source: EIA, NYMEX
Chart prepared by: Majority Staff,
Senate Permanent Subcommittee on Investigations


U.S. Crude Oil Inventories
2007 Compared to Previous 5-Year Average
millions of barrels
380
360
340
320
300
280
260
2007
5-year
average,
2002-06
1/5/07
2/5/07
3/5/07
4/5/07
5/5/07
6/5/07
7/5/07
8/5/07
9/5/07
10/5/07
11/5/07
11/23/07
Data source: EIA
Chart prepared by: Majority Staff,
Senate Permanent Subcommittee on Investigations

U.S. Crude Oil: Prices and Inventories at Cushing, OK
2007



Data source: EIA
Chart prepared by Majority Staff,
Senate Permanent Subcommittee on Investigations


Speculative Interest in Crude Oil
(Percent of Open Interest Held by Speculators)
45%
40%
35%
30%
25%
20%
15%
10%
Jan-00
Jan-01
Jan-02
Jan-03
Jan-04
Jan-05
Jan-06
Jan-07
Dec-07
Data source: CFTC
Chart prepared by: Majority staff
Senate Permanent Subcommittee on Investigations

Testimony of

Guy Caruso

Administrator

U.S. Energy Information Administration

before the

Subcommittee on Energy

Committee on Energy and Natural Resources

and the

Permanent Subcommittee on Investigations

Committee on Homeland Security and Governmental Affairs

United States Senate

December 11, 2007

Mr. Chairmen and Members of the two Committees, I appreciate the opportunity to appear before you today to discuss recent developments in the crude oil markets, in particular the factors that are contributing to the increases in petroleum prices.

The Energy Information Administration (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.

EIA believes that supply and demand fundamentals, including strong world economic growth driving an increase in consumption, moderate non-Organization of the Petroleum Exporting Countries' (OPEC) supply growth, OPEC members' production decisions, low OPEC spare production capacity, tightness in global commercial inventories, worldwide refining bottlenecks, and ongoing geopolitical risks and concerns about supply availability, have been the main drivers of oil price movements over the past several years.

My testimony will discuss these factors and the role of speculation in more detail. Much of my testimony today relies on EIA's monthly *Short-Term Energy Outlook* (*STEO*), most recently released today; a supplement to the November *STEO* (*Why Are Oil Prices So High*?); and our weekly report, *This Week in Petroleum (TWIP)*, which explores trends in oil markets.

There are currently about 161 different internationally-traded crude oils, which vary in terms of characteristics, quality, and market penetration. The major benchmark of crude oil in the U. S. is West Texas Intermediate (WTI) crude oil, which is of very high quality and is excellent for refining a larger portion of gasoline. This combination of characteristics, as well as its location, make WTI an ideal crude oil to be refined in the U. S., the largest gasoline consuming country in the world. WTI is traded on the New York Mercantile Exchange (NYMEX) futures market, while other crudes similar in quality, such as Brent from the North Sea, may be substituted for delivery, should that actually occur.

The widely-reported NYMEX futures price for crude oil represents (on a per-barrel basis) the market-determined value of a futures contract to either buy or sell 1,000 barrels of crude oil at a specified time. While relatively few NYMEX crude oil contracts are actually executed for physical delivery, the NYMEX market provides important price information to buyers and sellers of crude oil.

Recent Developments in Oil Prices. The price of WTI crude oil, which averaged $56 per barrel in 2005 and $66 per barrel in 2006, is projected to average $72 per barrel in 2007 and increase to nearly $85 per barrel on average in 2008 (**Figure 1: WTI Crude Oil Price**) . With the rise in prices, oil markets have been drawing increased interest and participation from investors and financial entities without direct commercial involvement in physical oil markets. The role of these non-commercial futures market participants (as

opposed to "commercial" participants, whose activities are presumed to represent hedging of physical positions) in recent price developments is difficult to assess, particularly over short time intervals. However, general principles favor a focus on market fundamentals, rather than consideration of alternative price drivers, when the explanatory power of fundamentals is high.

Recent price increases are an extension of oil market developments originating in the 1990s. With relatively high inventories and ample surplus production capacity, oil prices fluctuated around $20 per barrel for much of the 1990s. When the spot price moved above or below this level, futures contract prices stipulating 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 members shifted towards a tight inventory policy and global oil demand recovered from the slowing effect of the Asian financial crisis of the late 1990s, the global oil 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 a $50 upward trend from $20 to $70 per barrel (and just recently to well over $90). At this point, prices of distant futures contracts began to rise along with spot prices, implying that market participants no longer expected prices would to return to the levels that prevailed in the 1990s.

Increases in Global Oil Demand. 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, significantly reduced global excess production capacity.

Continued strong world economic growth has resulted in robust world oil demand despite higher price levels. China, the United States, and the Middle East countries are the main drivers of consumption growth, and China and the United States alone are projected to account for half of world oil consumption growth in 2007 and 2008 (**Figure 2: World Oil Consumption**). The Chinese economy has shown few signs of slowing down substantially, and the economies of oil exporting countries in the Middle East and in Russia have also benefited from higher oil revenues, thereby boosting their own oil consumption. Because there are time lags in both behavioral responses to higher prices, such as reducing miles of travel, and in investment responses, such as new oil production and refining projects and purchases of more energy-efficient vehicles, recent price increases have had only limited impacts so far on the amount of oil consumed or produced. It takes a large percentage increase in prices to reduce demand to bring it in line with a relatively small percentage shortfall in supply.

Oil Supply Growth. A key factor contributing to high prices has been the inability of non-OPEC production growth to keep pace with the increase in global oil consumption (**Figure3: Non-OPEC Production Growth**). Non-OPEC production increased by 0.2 million barrels per day (bbl/d) in 2006 and is projected to rise by 0.6 and 0.9 million bbl/d in 2007 and 2008, respectively, significantly less than the increase in global oil

consumption. Non-OPEC production growth remains concentrated in a few areas and has experienced some downward revisions in recent years due to project delays and growing decline rates in some non-OPEC nations, especially Mexico, the United Kingdom, and Norway.

When non-OPEC supply growth is less than growth in global consumption, the gap needs to be filled by OPEC members' production increases, or else draws from global inventories will result. In addition, fairly low OPEC surplus production capacity, which is concentrated in Saudi Arabia, leaves the market with little flexibility to respond to surprises in supply and demand. EIA's outlook for continued rising oil consumption and moderate non-OPEC production growth suggests that world surplus production capacity will remain fairly low at around 2 to 3 million bbl/d.

OPEC Production Cuts. OPEC decided to maintain existing production targets at last week's meeting in Abu Dhabi. The combination of recent price weakness, downward revisions in demand projections, and higher supplies already expected from Saudi Arabia, Angola, Iraq, and Abu Dhabi (after recent maintenance), led OPEC to dismiss the need for additional supplies. OPEC's decisions to cut production in November 2006 and February 2007 played a critical role in reversing the oil price slide at the end of last year. OPEC's announcement in September 2007 that it would increase production beginning on November 1 may just be beginning to dampen upward price pressure, but it is unlikely that these higher volumes will be enough to halt the downward trend in commercial inventories over the next several months. While Organization for Economic Cooperation and Development (OECD) commercial inventories were 150 million barrels above their 5-year average at the end of September 2006, EIA projects that OECD commercial stocks will be 12 million barrels below the 5-year average by the end of this year. EIA projects that inventories (measured on a days-supply basis) in the first quarter of 2008 will continue to decline relative to the average, and will move toward the lower end of the 5-year range through 2008 **(Figure 4: Days of Supply of OECD Commercial Oil Stocks).**

Low Surplus Capacity. World surplus production capacity, as noted previously, will remain fairly low at around 2 to 3 million bbl/d 2007 and 2008 **(Figure 5: OPEC Surplus Crude Oil Production Capacity).** Without significant surplus capacity, market participants can no longer rely on increased production from key members of OPEC to offset any supply disruptions and restore balance to the market, without the need for 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 time lag. With little excess capacity, continued expectations for demand growth, and large geopolitical uncertainties that could significantly disrupt supply, market behavior has shifted to reflect extremely tight conditions.

Role of Inventories. The inverse relationship between crude oil prices and the level of inventories remained stable during periods in which key OPEC members had significant surplus capacity and were able and willing to use it to offset market disruptions. Since

mid-2004, however, the relationship between prices and the level of inventories has changed to one in which higher prices are weakly correlated with increasing inventories. This fact alone appears confusing to some analysts, who may attribute this shift to speculation. But this relationship is not unusual given current circumstances. As oil market participants perceive the large reduction in the surplus capacity cushion that can be used to sustain previously prevailing prices in the event of a disruption, they are increasingly inclined to build and maintain a higher level of precautionary stocks during periods of heightened geopolitical risks.

Geopolitical Uncertainty. Unlike the level of inventories or the amount of surplus capacity, geopolitical risk cannot be readily quantified, but fear of potential disruptions and actions taken to prepare for them are inherently fundamental forces in determining the demand for inventories in today's oil marketplace. Geopolitical instability in many OPEC, as well as non-OPEC countries, thus has put additional upward pressure on inventory demand and crude oil prices. A lack of political stability continues to threaten production in several OPEC nations, including Iraq, Nigeria, Venezuela, and Iran. The threat of a possible Turkish incursion against Kurdish rebels in Iraq has added to supply worries.

Refining Capacity. Low global excess refining capacity, which has been shrinking as refined product demand has grown, leaves less of a buffer for periods when the supply and demand balance becomes unusually tight. Furthermore, low excess refining capacity leaves little flexibility to economically accommodate unplanned refinery outages. In OECD Europe, total commercial product inventory levels actually declined from June to September 2007 by 200,000 barrels per day, in contrast to the last 5 years when inventories increased on average during these months by 100,000 barrels per day.

Value of the Dollar. In addition, the decline in the value of the dollar against other currencies supports continued oil consumption growth in foreign countries because oil is traded globally in dollars, and a declining dollar has made the economic impact of the increase in oil prices less severe in foreign currencies.

Role of Speculation. Speculation in general, or more specifically "speculators" as a class of market participants, are cited by some observers as a driver of current high oil prices, at least partially because some assume that increased activity by these non-commercial participants automatically leads to higher prices. Much discussion has been prompted by the observation that non-commercial participation in the crude oil futures market is higher when oil prices are rising, and some analysts even draw a causal relationship between the former and the latter.

Efforts to quantify the influence of speculation on oil prices generally focus on relationships between price levels and NYMEX futures contracts held by certain classes of traders. By far the most extensive analysis of this kind has been performed by staff of the Commodity Futures Trading Commission (CFTC). CFTC economists, using a detailed set of position-level trading data not available elsewhere, have analyzed the behavior of managed money traders (MMTs) in relation to other market participants and

found both that MMTs are more prone to follow than to lead position changes by others and that MMT position changes had a significantly negative relationship to price changes in the crude oil market.

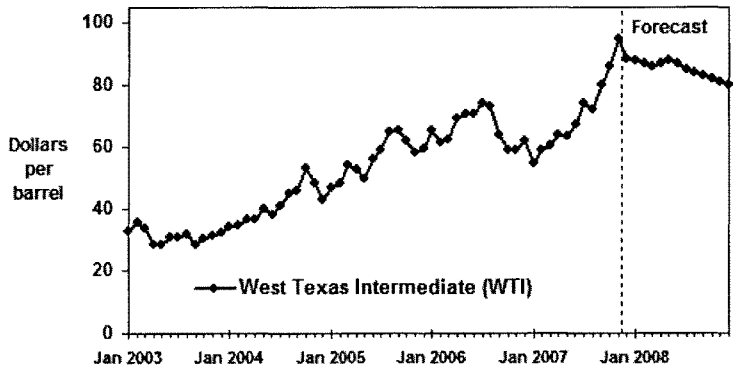
As **Figure 6 (Net Position of Non-Commercial Participants in WTI Futures Contracts vs. WTI Price)** shows, there have been many instances over the past few years in which crude oil futures prices have increased, along with an increase in the net long (that is, more buyers than sellers) positions of non-commercial participants--of course implying a counterbalancing increase in commercial participants' net short positions during these periods. This pattern seems to have held most of the time since 2005. However, there have been key periods in which the net position of non-commercial participants did not move in the same direction as prices. For example, while the average price remained around $95 per barrel over the first part of this November, the net long positions varied dramatically. Additionally, the net long positions were significantly higher in July 2007, even with oil prices more than $20 per barrel lower than they were in November. Thus, any apparent correlation between rising speculative activity and rising prices is a loose one at best. The available evidence, reinforced by the CFTC's June 2006 study, suggests that speculators shift positions in response to price changes. In particular, should the tight supply and demand conditions weaken or be expected to soften, speculative activity (i.e., long positions) would likely decline, as has been seen very recently.

Speculators and others have moved towards investing in oil markets because of tight fundamentals. In other words, high oil prices are likely to be increasing participation by non-commercial traders, rather than the other way around.

In conclusion, EIA's analysis points to strong demand growth, a dramatic decline in global surplus capacity, and global refining capacity constraints as the major factors driving oil prices higher. Our rationale for fundamental factors leading to increased speculative activity is straightforward. During the 1990s, when excess capacity was ample and market participants perceived that members of OPEC were both able and willing to ensure that prices would remain near $20, there was little motivation for commercial producers and consumers of energy to shed risk, or hedge, since there was little perceived risk. With little desire to shed risk, there was only a small role for those who wished to take on the risk: the speculators. During the current decade, when excess capacity has declined and market participants perceived that OPEC members would no longer maintain stable prices in the environment of geopolitical risk, market participants have become increasingly less certain of the path of future oil prices. With this increased uncertainty, commercial producers and consumer of energy increased their desire to hedge their risk. With this increased desire to shed risk, there was a much larger role in the market for those prepared to bear this risk.

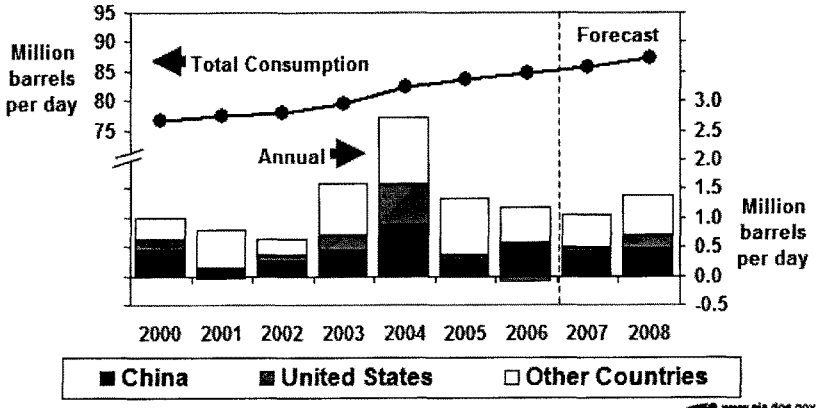
This concludes my statement, Mr. Chairmen, and I will be happy to answer any questions you and the other Members may have.

Figure 1: Crude Oil Prices



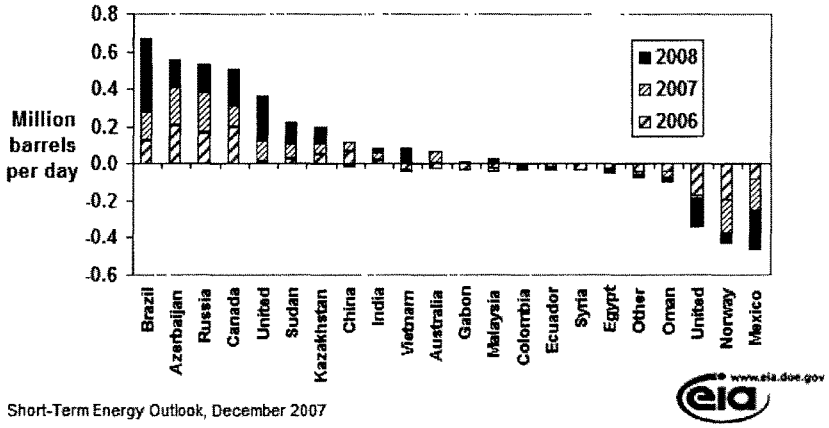
Short-Term Energy Outlook, December 2007

Figure 2: World Oil Consumption



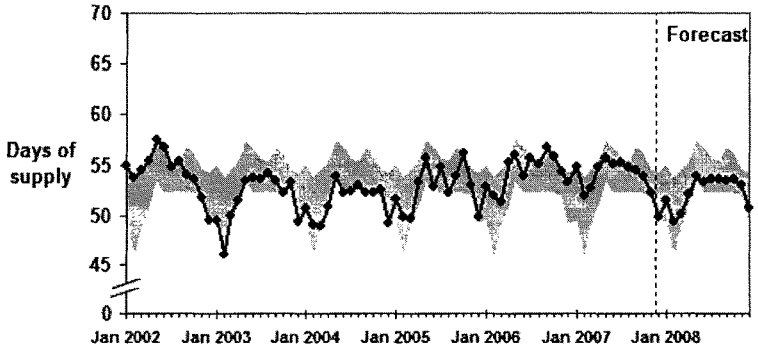
Short-Term Energy Outlook, December 2007

Figure 3: Non-OPEC Oil Production Growth (Change from Previous Year)



Short-Term Energy Outlook, December 2007

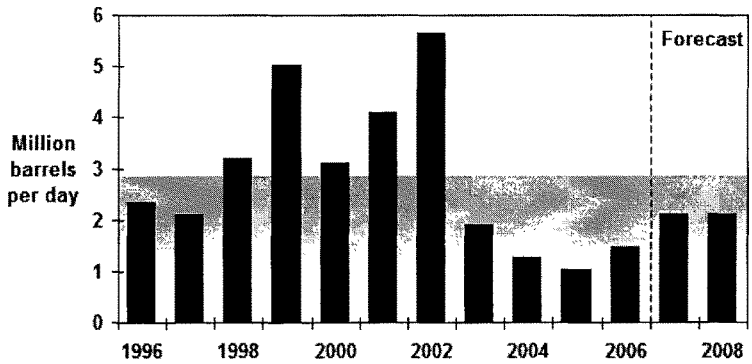
Figure 4: Days of Supply of OECD Commercial Oil Stocks



NOTE: Colored band represents the 5-year minimum/maximum range for each

Short-Term Energy Outlook, December 2007

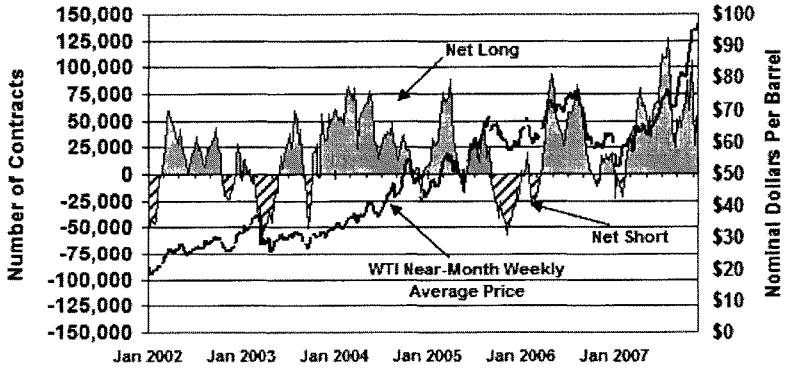
Figure 5: OPEC Surplus Crude Oil Production Capacity



Note: Shaded area represents 1996-2006 average (2.8 million barrels per day)

Short-Term Energy Outlook, December 2007

Figure 6: Net Position of Non-Commercial Participants in WTI Futures Contracts vs. WTI Price



Short-Term Energy Outlook, December 2007

STATEMENT OF
FADEL GHEIT
Managing Director and Senior Oil Analyst
Oppenheimer & Co. Inc.

Good morning ladies and gentlemen

I would like to take this opportunity to thank Senators Levin, Coleman and all members of this panel for inviting me to share my views on the role of speculation in the recent run up in oil prices.

I am a Managing Director and Senior Oil Analyst with Oppenheimer & Co. Inc. I have over 30 years of energy industry experience, including 21 years on Wall Street as an oil analyst. I would like to emphasize that my comments today reflect my own personal views and not those of Oppenheimer & Co. Inc.

Oil is a commodity, but unlike any other, it is critical to global economic growth and our national security. It impacts our lives, influences our national policies, both domestic and foreign, and is likely to play a key role in shaping our future.

Over the last 40 years, oil prices fluctuated from under $3/barrel to a record of more than $98/barrel a few weeks ago. Oil traders and the media were cheering the rise in oil prices and hoping for oil to break the $100 mark. Some analysts even predicted that oil prices are heading for $120 by the end of this year and that prices could exceed $150 or $200 in the next two years.

I don't know where the price of oil will be a month from now or a year from now, but I believe the current high oil prices are inflated by as much as 100%. I don't think industry fundamentals of supply and demand justify the current high prices, which I believe, are driven by excessive speculation. Based on various press accounts, others who share this view include our Energy Secretary, most OPEC ministers, and the heads of major international oil companies.

Oil prices were close to $60 in August and rose sharply to almost $100 in November, although there were no changes in world oil supply or demand. The price surge, in my view, was a result of excessive speculation about potential supply disruption in the event of military strikes against Iran. The passing of the Senate resolution regarding the Iran Revolutionary Guard as a terrorist organization seem to have been the catalyst speculators needed to fan the fire. The drop in the value of the US dollar against major currencies as a result of the Fed decision to lower interest rates, also contributed to the sharp rise in oil prices.

No one has been able to accurately and consistently forecast oil prices—not oil companies, governments, or the Wall Street investment community. This lack of reliable oil price forecasting has created a vacuum that has been filled by financial players with very short investment horizons, which significantly increased oil price volatility.

The globalization of the financial markets, ease of trading, rapid movement of large sums of capital, information overflow, and increased global tension, have created an ideal environment for excessive speculation in the world oil markets.

Oil price volatility has attracted a large and growing number of speculators seeking the highest profit in the shortest time. Volatility, however, has an adverse impact on the oil industry because it increases uncertainty, and distorts market fundamentals, which could result in poor investment decisions in securing adequate reliable supply to meet global energy demand. The oil industry operates in an environment driven primarily by factors it does not control.

Global economic growth increased world oil demand and reduced OPEC spare production capacity to historically low levels. Non-OPEC production is hampered by project delays, rising costs and technical problems. These factors increased the risk of potential supply tightness.

I believe that the oil markets need assurances from leaders of both major exporting and major importing countries as well as the oil industry. People need to know that the world is not running out of oil, that supplies are adequate, and that global stockpiles are sufficient to make up for any potential supply shortfall or demand surge.

It is worth noting that the current global oil inventories of more than 4 billion barrels exceed the oil volume exported from Iran for more than two and a half years, from Saudi Arabia for 15 months, and from the entire Middle East for six months.

I believe that oil speculators use the weekly petroleum data published by the Energy Information Administration to manipulate oil prices for short-term gain. Speculators have used declining inventory levels to spread fear about potential shortages, when in fact it indicates exactly the opposite. Reducing inventory levels improves capital efficiency, especially in a high price environment. In addition, oil price backwardation makes it even more prudent for the oil industry to reduce inventories further. But, more importantly, declining inventories, in my view, underscores that the industry is less concerned about shortages and is more confident about supply availability.

While oil trading helps protect long-haul crude shipments against price volatility, I believe it should be regulated, to ensure transparency, discourage excessive speculation and prevent potential conflict of interests and abuse by traders. Several measures should be considered to regulate oil trading by financial players, including major investment banks, commodity traders, hedge funds, and private equity funds. These include:

- Raising the current margin requirement to 50% of the value of the trade,
- Setting limits on the number of oil contacts by each account,
- Establishing minimum holding period,
- Preventing conflict of interests by financial institutions.
- Imposing stiff penalties on violators, including minimum jail sentences.

Financial Energy Markets and the Bubble in Energy Prices:

Does the Increase in Energy Trading By Index And Hedge Funds Affect Energy Prices?

Testimony Before a Joint Heating of the U.S. Senate Permanent Subcommittee on Investigations of the Committee on Homeland Security and

The Governmental Affairs and the Subcommittee on Energy of the Committee on Energy and Natural Resources

December 11,2007

By

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BACKGROUND: THE "FINANCIALIZATION" OF ENERGY MARKETS

Do financial energy markets affect the level and the volatility of oil and gas prices? We use the term "financial energy markets" here to mean the collective of trading arenas in which forward energy prices evolve from trades on (1) formal traditional exchanges (notably the New York Mercantile Exchange), (2) new forms of exchanges that combine traditional and over-the-counter transactions (notably, the Intercontinental Exchange), and (3) bilateral energy contracts whose prices are indexed to those of the exchanges.

Discussions within the oil and finance community reflect various perspectives on this issue. The discussions raise a very important question: did the increase in oil prices to almost $100/barrel and natural gas prices above $10 per MMBTU in 2006 and 2007 reflect classic commodity "bubbles" in which financial markets played a distinct, *sui generis* role[1]; or a "new regime" of permanently higher prices brought about by sharp increases in demand and enduring changes in supply, which pushed both crude oil and natural gas into suddenly much higher marginal production costs? As always, the answers are not mutually exclusive. We may be living in a period when there has been a "perfect storm" of conditions conducive to higher energy prices.

This is obviously an enormously complication question. The number of dollars involved in energy futures and over the counter markets (collectively, the energy derivatives markets) is measured in the hundreds of billions. The physical oil market is global in scale, and information about global oil stocks and flows is notoriously incomplete. The flow of investor funds into commodities; into the fuels segment of commodities; into individual fuels; and from the long to the short side of particular markets is also immense and has been growing rapidly in the last five years.

The question the House and Senate committees are exploring this week is whether the increase in the volume and open interest in oil and gas derivatives markets has a significant impact on world crude oil and petroleum product prices, and on U.S. natural gas prices.[2] I believe this is likely to be one of those questions that – to use Gregory Treverton's useful distinction[3] -- is a mystery, rather than merely a puzzle. In their formal capacities, economists are trained to treat problems as puzzles, amenable to rational analysis. That requires enough information to move the problem from the mists of mystery to the brighter lights of puzzles. There are reasons to believe that condition does not exist, yet, in this case.

How do financial energy market activities influence energy prices? In articles I have published on this issue[4], I have compared the "flow of funds" of the magnitude we are seeing today to a new wave of buyers and sellers interested in oil and gas. Could that flow have created

[1] We use *sui generis* here in its legal context: as a unique, distinct, or one-of-a-kind effect.

[2] ESAI first called attention to the apparently growing influence of financial markets in a memo we sent to our clients in 1994, which was subsequently published as an article in Energy Risk (November 1994)2. Subsequent elaborations on our argument have appeared in memos to our clients as well as in later issues of *Energy Risk* and in *Managed Derivatives* (August 1996).

[3] Gregory Treverton, "Intelligence – A Funhouse of Reflections," Commentary on the website of the Rand Corporation; http://www.rand.org/commentary/0216SFC.html (January 17, 2007.

[4] Edward N. Krapels, "Hunters or Hunted?" *Managed Derivatives*, May 1996, pp. 14-15.

a "bubble" in oil and gas prices in 2005, 2006 and 2007? Examples of such bubbles abound. From Dutch tulip markets in the 1600s to Internet equities in the 2000s and the subprime mortgage crisis today, asset classes routinely go through booms and busts created – not by any change in the costs of production or technological change in the value added by consumption – but purely by virtue of a change in investors' desire to own the asset.

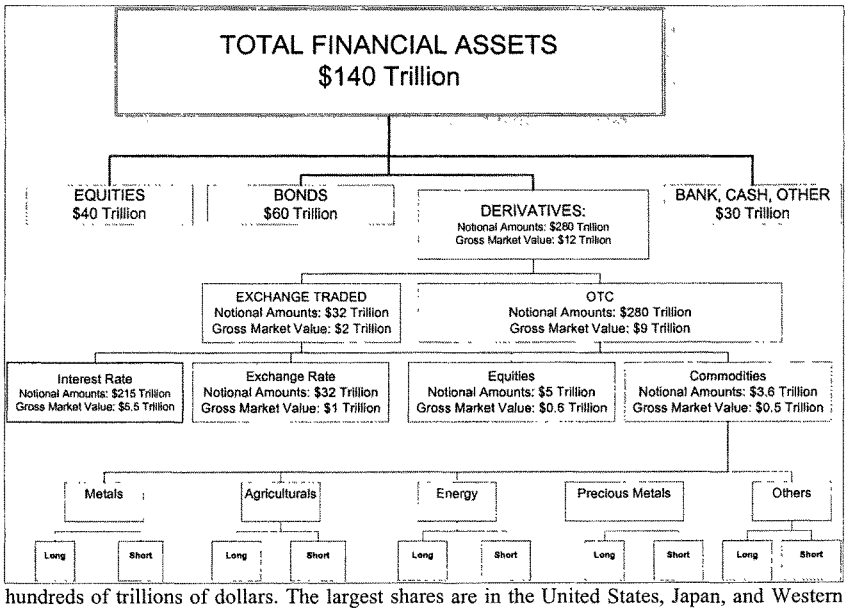
There were forward and derivative instruments in oil markets as far back as the 1860s, but they were not as ubiquitous and as easy to use as those available today. Before the advent of modern financial markets, the desire to own oil could manifest itself in only limited ways. One could hoard physical barrels of oil, put them in storage, and sell them at a later date (at a profit or a loss). Or, one could buy the equity or debt instruments of oil producing companies.

Beginning in the 1980s, the emergence of a viable and liquid futures market for oil made it much easier for investors and traders to deal in the commodity: they could buy or sell contracts, settled by an Exchange. U.S. natural gas followed suit in the early 1990s. Like any other futures market, the oil and gas futures markets allow one class of participants to hedge, and another class of participants to speculate. Speculators play an important role: they allow hedgers to put aside the risk of commodity price fluctuations to others better able or more willing to live with them. Oil and gas producers and consumers are hedgers, small traders and larger financial institutions, like hedge and private equity funds, some investment banks, and specialized energy trading outfits, are speculators.

Even though many crude oil and natural gas producers, oil refiners, and petroleum product and natural gas consumers do not hedge, the fact remains that New York Mercantile Exchange (NYMEX)-traded West Texas Intermediate (WTI) crude oil and Intercontinental Exchange (ICE) –traded Brent crude oil, American and European heating oil and gasoline, and U.S. natural gas contracts have become benchmarks of <u>both</u> physical commodities and financial assets whose price fluctuations affect the economics of the entire energy industry as well as those buying services from that industry. Thus, even purely commercial participants in oil and gas markets are just as affected by the force of financial energy markets as are the speculators and hedgers that use them every day.

Beginning in the 1990s, some participants in oil and gas markets began to suspect that the trading behavior of institutional speculators was influencing prices. These speculative organizations had been minor participants in the financial oil markets since the crude oil contract was launched in 1984. By the mid-1990s, however, the number of financial investors trading crude oil contracts began to increase rapidly. The increase was not confined to oil: to the contrary, one can only understand the phenomenon, and how to deal with it, if one understands the larger investment picture in global financial markets.

With the wide array of contracts and assorted rules on leveraging trades, international financial markets have become extremely complicated. In every economy, wealth is held in the form of land, precious metals, goods, and financial instruments like stocks, bonds, currency holdings, and futures contracts. The stock of wealth, on a global scale, has to be tallied in the



hundreds of trillions of dollars. The largest shares are in the United States, Japan, and Western Europe.[5]

If the stock of global wealth can be measured in the hundreds of trillions of dollars, the flow of funds – which no single institution measures systematically – amounts to several trillions of dollars over the course of a year. Thus, a Japanese investor may sell his real estate in Tokyo in order to buy stocks in Malaysia, or U.S. Treasury Bills, or crude oil futures contracts, or a trunkful of gold or silver. He may also deposit his funds in a bank, which then makes loans, engages in swaps, and sells futures and options in the over the counter markets.

This intricate web of investments, loans, and derivatives has grown exponentially over the last ten years. Parts of this web are always under some pressure. There is almost always a small meltdown or bubble somewhere. In 1998 and 1999, the meltdowns were very large indeed. Asian equity, real estate, and currency markets collapsed. In 2001, the meltdown occurred in U.S. and global equity markets in the spring of 2000.

Meltdowns can happen anywhere. In late September 1998, reports began to circulate of a successful effort by the New York Federal Reserve Bank to orchestrate a $3.5 billion bailout of a hedge fund (Long Term Capital). According to new reports, "Wall Street's biggest power brokers agreed to prop up one of their most aggressive offspring, Long-Term Capital

[5] For a valuable summary, see *International Capital Markets: Developments, Prospects, and Key Policy Issues*, International Monetary Fund, (a Staff Team led by Charles Adams, Donald J. Mathieson, Garry Schinasi, and Bankim Chadha). Available on the World Wide Web at http://www.imf.org/external/pubs/ft/icm/icm98/index.htm

Management, L.P., a highflying hedge fund that was on the verge of collapse."[6] According to the *Wall Street Journal,* one of the "hotly debated topics" in the meeting that reached the accord to bail out the Fund was that its failure "would put the entire financial system at risk" because the Long Term Capital had leveraged its several billion dollars of investment capital into a market position that at times exceeded $100 billion.

FINANCIAL MARKETS AND ENERGY FUNDAMENTALS

Some authoritative observers – like former Federal Reserve Chairman Alan Greenpsan and eminent oil economic Robert Mabro -- believe the financial markets have a *sui generis* impact on oil prices. If so, there must be "fundamentals of paper markets" that one must assess along with the fundamentals of the physical markets in order to obtain a complete view of oil pricing dynamics. Others are more skeptical, believing that futures and forward prices reflect entirely information about the fundamentals of the physical market. Some of those who believe the financial markets have a *sui generis* impact on prices are advocating stricter regulation of energy trading activities. Given the ease of international capital movements, however, it is unclear whether regulation in and by the United States would have much effect: squeezing one part of the energy trading balloon may only cause the bubble to appear elsewhere.

Discussions within the oil and finance community reflect various perspectives on the issue: do oil prices above $50/barrel and natural gas prices above $5 per MMBTU reflect classic commodity "bubbles" in which financial markets played a distinct, *sui generis* role, or a "new regime" of permanently higher prices brought about by sharp increases in demand, which pushed both crude oil and natural gas into suddenly much higher marginal production costs. Recognizing that both financial and physical dynamics are always at play, the issue nevertheless is whether the financial dynamics have a distinct and measurable role.

The bubble argument suggests that developments in financial energy markets (especially the increase in cash under management of hedge and other funds, and the decisions of index-oriented funds to take long positions in commodities, including energy) may have precipitated a classic period of "too many buyers chasing too few sellers" of financial oil instruments. Such periods of "excess demand" have occurred hundreds of times in competitive markets over the course of centuries. Once oil and gas developed futures and forward market instruments, with all of the fungibility characteristics of such instruments, they too became prey to purely financial bubbles. The potential for such bubbles increased in recent years because of the massive scale of increased involvement of financial institutions that heretofore had not been significant players in the energy space.

For example, Robert Mabro argues that

> "Econometric models show that the net position of the so-called 'non-commercial traders' is correlated with the subsequent direction of price changes. In other words, when the non-commercial entities hold a net long position (they are betting on a price rise) prices often do rise. And the opposite impact occurs when

[6] "A Hedge Fund Falters, and Big Banks Agree to Ante Up $3.5 billion," *Wall Street Journal,* September 24, 1998, p. A-1.

these entities hold net short position. Is it not odd that the non-commercial players (meaning very broadly the non-oil companies) should lead and the commercial entities (broadly speaking oil or energy companies, oil users and oil-related agents) should follow in what is supposed to be an oil market?"[7]

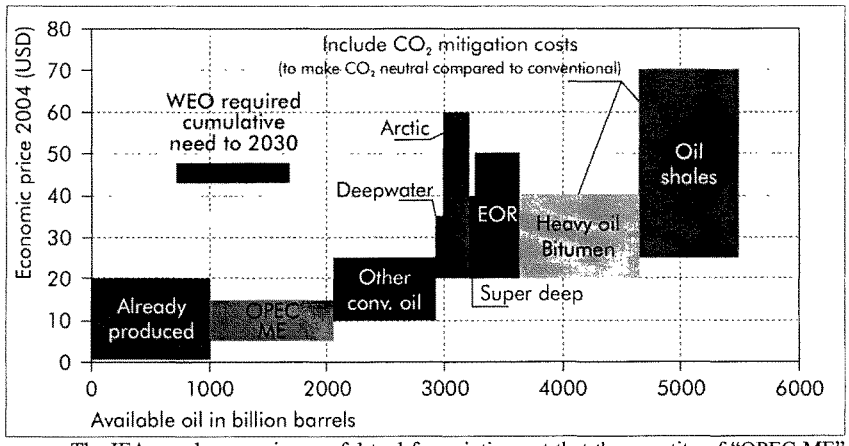
Others believe in variations of a "new regime" argument that has two dimensions. On the supply side, they would argue that there has been a permanent movement up the oil and gas production cost curve caused by a lack of investment by and in the petroleum extraction industry. On the demand side, there has been an increase in the rate of growth in oil and gas demand (the oil side mostly from Asia; the gas side mostly from increases in the use of combined cycle gas turbines). Taken together, the new regime is characterized by increases in demand for oil and gas that exceed the increase in supply. Thus, the new regime argument indicates it was inadequate investment in production, not excess investment in financial energy markets, that was primarily behind the massive price increases of 2000 – 2006.

In the oil market, many focus on the fact that spare crude oil production capacity has diminished, and there have been additional concerns over supply adequacy caused by the increasingly prominent "peak oil" thesis.[8] Such long-term concerns can explain why market participants have bid up the price at the back of the forward curve. Sellers at the back end of the curve may believe the peak oil argument is overblown, and that in any event marginal cost does not set the crude oil price.

A third and more nuanced view – in some variations related to Peak Oil – argues that the world has exhausted most of the oil that is available at finding costs of less than $10/barrel. This leads to a traditional, increasing-marginal-cost explanation for higher oil prices. The chart above presents the relationship between production cost, oil already produced, and the marginal costs of alternatives to "cheap oil" as seen by the International Energy Agency (IEA). The IEA supply curve indicates that there are 5 *trillion* barrels of oil available at "economic prices" of less than $70/bbl (in 2004 dollars). If this is correct, and the oil extraction business still responds to economic opportunities, then the market prices of $70/barrel reached in 2006 were unsustainable, and constituted a classic commodity "bubble." The financial energy markets, by providing such convenient vehicles for the financial expression of views about oil scarcity, will have contributed to the bubble.

[7] Robert Mabro, "Robert Mabro Questions the Suitability of the Current Oil Price Regime," *Oxford Energy Forum*, February 2007, page 15.

[8] Those who adhere to the Peak Oil argument have developed , *inter alia*, regular conferences and journals reviewing the topic. See the Peal Oik web site maintained by Colin Campbell at http://www.peakoil.net/.



The IEA supply curve is a useful tool for pointing out that the quantity of "OPEC ME" (OPEC Middle East) available oil is curtailed by instability (as with Iraqi oil), failure to maintain fields properly (as some believe is the case with Iranian reserves), and deliberate under-production of available reserves by governments who have decided that their nations' discount rates are very, very low. The conundrum is that there is still a great deal of oil in the "OPEC ME" category, available for exploitation at less than $15/bbl, but there are political constraints on its expeditious production. Those who invest in more expensive oil are essentially taking a political gamble that this oil will continue to be held off the market, making it economical to invest in the production of more expensive conventional and unconventional oils. In essence, they are speculating on the assumption that the sub-$15 barrels are no longer on the margin.

For investors, these arguments are of more than academic interest. Any investment in high-cost conventional oil resources runs the risk that the constraints on producing more of the sub-$15 oil pool will be relieved. Such relief could come from resolution of political conflicts in the Middle East, thus releasing the pent-up Iraqi reserves, or from a decision by Saudi Arabia to double its production.

In the absence of liquid financial energy markets, market participants could express their views on these issues in only two "physical" markets: the spot market, and the markets for oil in the ground.[9] The existence of financial energy markets provides a forum for the expression of views in the arena between spot markets and oil in the ground. Financial energy markets are available for the "prompt month" (which should converge with the spot price), and then for months and years into the future.

[9] While derivative markets for oil have existed in some forms since the 19th century, we will date the emergence of the modern petroleum derivatives markets with the successful launch of the forward markets in the North Sea in the late 1970s and the successful launch of the New York Mercantile Exchange crude oil contract in 1984. We treat investments in oil producing companies as a subset of the market for oil in the ground.

Concerns About the Impact of Financial Markets

As prices rose from the customary trading range of $10 to $30 in the 1990s, to $30 - $100 beginning in 2002, the debate about the role of financial markets became more heated, and attracted notable participants, especially in the United States. In the summer of 2006, a number of investigative committees of the U.S. Senate conducted hearings on the issue, and one committee—the Permanent Subcommittee on Investigations – issued an influential report titled *The Role of Market Speculation In Rising Oil and Gas Prices: A Need To Put the Cop Back On the Beat.*

Former Federal Reserve Chairman Alan Greenspan explained to the Senate Foreign Affairs Committee that there had recently been "a major upsurge in over-the-counter trading of oil futures and other commodity derivatives." Greenspan observed that "increasing numbers of hedge funds and other institutional investors began bidding for oil [and] accumulated it in substantial net long positions in crude oil futures, largely in the over-the-counter market," and that these activities affected oil prices: "These net long futures contracts, in effect, constituted a bet that oil prices would rise... With the demand from the investment community, *oil prices have moved up sooner than they would have otherwise.* "[10]

Mr. Greenspan also suggested that these price increases have stimulated additional oil production, a large increase in oil inventories, and a partial scale-back of consumption.[11]

The U.S. Senate sub-Committee investigating oil prices in 2006 concluded that

> "[T]here is substantial evidence that the large amount of speculation in the current market has significantly increased prices. Several analysts have estimated that speculative purchases of oil futures have added as much as $20-$25 per barrel to the current price of crude oil, thereby pushing up the price of oil from $50 to approximately $70 per barrel."[12]

These opinions about the effect of speculation in financial energy markets on oil prices appears to be based on a fairly straightforward proposition: the large and sudden increase in the market position of any subset of oil market participants will tend to move prices up if the increase is in demand (expressed in financial energy markets as an increase in long positions) and down if the increase is in supply (expressed in financial markets as an increase in short positions). Even though there is "a long for every short and a short for every long," any large market participant can create sudden surges in supply or demand (or sudden shifts in the demand or supply curves of the oil market).

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[10] Greenspan, Alan. *Statement before the Senate Committee on Foreign Relations, United States Senate*, June 7, 2006.

[11] Coleman, Norm (Chairman). Levin, Carl (Ranking Minority Member). *The Role of Market Speculation In Rising Oil and Gas Prices: A Need To Put the Cop Back On the Beat*, Staff Report, Permanent Subcommittee on Investigations, U.S. Senate, June 27, 2006, page 3. Hereafter, Coleman [2006].

[12] Coleman, Norm (Chairman). Levin, Carl (Ranking Minority Member). *The Role of Market Speculation In Rising Oil and Gas Prices: A Need To Put the Cop Back On the Beat*, Staff Report, Permanent Subcommittee on Investigations, U.S. Senate, June 27, 2006, page 2.

For example, assume that on a given day an extremely large speculator decides to go short. His brokers will then attempt to purchase 5,000 short contracts. All other things being equal, the effect of such a large increase in the number of shorts demanded is to drive down the price. The order for 5,000 short contracts amounts to a search for 5,000 long contracts, and in the open outcry process on the floor of the NYMEX, the bid price will fall until the necessary number of longs are attracted to take the offsetting positions for the 5,000 shorts.

The nature of any market – financial or physical – is that such a process can feed on itself. If the intra-day price decline forces prices below a technical support level, those who trade on such signals will be attracted into the market, creating further downward price pressure. Market participants can wonder what led to the price decline if nothing of consequence was indicated in the physical supply-demand equation.

For many economists, such effects can be expected only if two conditions exist: a large market participant is exercising market power, or subsets of market participants are (deliberately or coincidentally) acting together, or "herding" and the effect of their acting together is to exercise market power.[13]

Trading Entities and Their Trading Styles

While hedge funds have attracted much of the attention of the press, they are only a subset of all of the institutions that trade oil. Even within their own cohort, hedge funds are an extremely variegated herd, each with its own directives and trading strategies. The effects of the oil trades of these participants are unlikely to flow in the same direction.

Quite apart from hedge funds, commercial and investment banks make a variety of offerings to investors that, ultimately, result in a financial institution placing substantial hedge positions in the market. For example, some banks offer structured notes indexed on oil with fixed or guaranteed returns. The buyers of these notes are not oil market participants, and purchase them largely for portfolio diversification.

Of greatest recent interest is the role of yet a third type of trading entity in the energy sector -- index or passive investors, who are looking for portfolio insurance via commodity returns, and are prepared to pay for the portfolio benefit. These funds may buy an index, like the Goldman Sachs Commodity Index, which guarantees them the return of the index. The seller of that index, usually a bank, hedges the index exposure in the energy market by buying the futures that correspond to the index. Some participate as buyers in a Roll Index, which could entail, for example, buying the second month futures. When the prompt month expires, the Roll Index participant holds the prompt, which they sell to buy the second month futures contract again.[14] Others take the opposite view, and are roll sellers.

[13] For a detailed presentation on the difference between these two market characteristics as it applies to financial oil markets, see Robert J. Weiner, *Do Birds of a Feather Flock Together: Speculator Herding in the World Oil Market*, (Washington DC: Resources for the Future Discussion Paper, June 2006).

[14] See, for example, Dizard, John, "Speculators Profit from Commodity Investors," which notes that speculators "In the pits, physical or electronic, bet against the certainty that commodity index investors' positions are rolled in a mechanistic manner every month, in known patterns on particular days." *Financial Times*, Jan. 22, 2007.

There is a substantial amount of anecdotal evidence that much of the increase in open interest in commodity contracts was precipitated by a decision of pension funds to increase their exposure to commodities. For example, the *Wall Street Journal* reported on September 9, 2004 that "at the start of the decade, Europe's two biggest pension funds had no commodity investments. Stichting Pensioenfonds ABP, the €157 billion ($190 billion) fund for Dutch government and educational-system employees, got into commodities in 2001 and has reached its target of having 2.5% of its assets, or close to $5 billion, in commodities. A year earlier, the €55.7 billion PGGM fund for Holland's health-and-welfare sector waded into commodities. It now has 4.3%, or roughly $3 billion, invested in them."

The interest in commodity exposure was not restricted to pension funds: "Harvard University has been investing in commodities for more than a decade, and its internal benchmark calls for allocating 13% of the university's $19.3 billion endowment to oil, gas and other commodities. That's just two percentage points less than the weighting assigned to U.S. stocks and two points more than the allocation to U.S. bonds. Unlike many pension funds that passively follow a benchmark, Harvard actively manages its commodity investments, and 10 percentage points of the 13 allocated to commodities are invested in timber."[15]

Within the financial community, however, it would be quite unusual for the trading activities of each of these entities to have effects in the same direction. To the contrary, one would expect that the effects of these traders on markets would *usually* be quite dispersed as each trader follows his own objectives. Anecdotal accounts refer to a variety of trading styles:

- *Mean reversion* traders believe that commodity prices tend to return to long-term averages, and thus their trades would tend to help market prices remain within given channels. *Chartists or technical traders* could accentuate trends when their systems indicate they should endure, and bring them to an end to when their systems indicate they should not. Notions of powerful "support" and resistance levels have long held sway over this community, and there is an array of software support available to those who trade in this manner.
- *Macro traders* believe in linkages between energy and other markets. These include incorporating views on macro-economic growth into energy trades (the "China syndrome"), or specific statistical relationships (dollar – yen – oil pricing dynamics).
- *Fundamental commodity traders* who believe they have superior information about energy supply and demand.
- *Passive investors* who only own energy contracts for their portfolio effects. In recent years, pension funds holding hundreds of billions of dollars began allocating a few percent to energy commodities. This so-called "index investing" is a trickle for this segment of the economy, however, is a torrent of investment for the energy sector. Banks make various offerings to their private banking

[15] Michael R. Sesit, "Commodities Enter Investment Mainstream," *Wall Street Journal*, September 9, 2004.

investors that, ultimately, may result in a financial institution placing substantial hedge positions in the market (whether these are shown as hedges in CFTC reports is unclear). For example, some banks offer structured notes indexed on oil with fixed or guaranteed returns. The buyers of these notes are not oil market participants, and purchase them largely for portfolio diversification.

- *Roll index* investors looking for portfolio insurance via commodity returns are prepared to pay for the portfolio benefit. They may buy an index, like the Goldman Sachs Commodity Index, which guarantees them the return of the index. The seller of that index, usually a bank, hedges the index exposure in the energy market by buying the futures that correspond to the index. Some participate as buyers in the Roll Index, which could entail, for example, buying the second month futures. When the prompt month expires, the Roll Index participant holds the prompt, which they sell to buy the second month futures contract again. Others take the opposite view, and are roll sellers.

Analysis of The Effects of Financial Markets on Oil and Gas Prices

In the past decade, various studies of the behavior of financial market participants have been conducted, and they have shed a considerable amount of light on what is, and is not, happening. In this endeavor, the primary source of data on financial traders' behavior is the "Commitment of Traders" report of the U.S. Commodities Futures Trading Commission (CFTC).

The CFTC divides market participants into "commercial" and "non-commercial" classes:

> "A trading entity generally gets classified as a "commercial" by filing a statement with the Commission (on CFTC Form 40) that it is commercially "...engaged in business activities hedged by the use of the futures or option markets." In order to ensure that traders are classified with accuracy and consistency, the Commission staff may exercise judgment in re-classifying a trader if it has additional information about the trader's use of the markets.
>
> A trader may be classified as a commercial in some commodities and as a non-commercial in other commodities. A single trading entity cannot be classified as both a commercial and non-commercial in the same commodity. Nonetheless, a multi-functional organization that has more than one trading entity may have each trading entity classified separately in a commodity. For example, a financial organization trading in financial futures may have a banking entity whose positions are classified as commercial and have a separate money-management entity whose positions are classified as non-commercial.
>
> The long and short open interest shown as "Nonreportable Positions" are derived by subtracting total long and short "Reportable Positions" from the total open interest. Accordingly, for "Nonreportable Positions," the number of traders

involved and the commercial/non-commercial classification of each trader are unknown."

Finally, as noted earlier in this report, the CFTC provides an additional level of detail on the behavior of non-commercials with its reports on spreading activities:

> "For the futures-only report, spreading measures the extent to which each non-commercial trader holds equal long and short futures positions. For the options-and-futures-combined report, spreading measures the extent to which each non-commercial trader holds equal combined-long and combined-short positions." [16]

Published COT data, while interesting and useful, however, are incomplete and sometimes unclear. The most important omission is over-the-counter market transactions. As noted earlier, over the past several years, more and more forward transactions (both energy and non-energy) have moved from organized exchanges like NYMEX to platforms for bilateral and OTC trades, particularly the Intercontinental Exchange. Thus, it is appropriate to consider the volume and open interest data of the NYMEX the tip of energy trading iceberg.

In addition, within the confines of the COT data, it is unclear how bright the line is between the "non-commercial" (a.k.a., speculators) and "commercials" (a.k.a., hedgers). Analysts disagree about the best way to use the data in the analysis of the influence of specific trading cohorts over prices. Some argue in favor of using total (commercial, non-commercial, and non-reporting) open interest, others total non-commercial open interest, and yet others total net non-commercial open interest.

Even though the COT data are incomplete and unclear, they are all the data practitioners have. Thus, given that is information, the analytical community has naturally tried to find relationships between changes in trading positions and prices. After some ten years during which a number of studies – with varying degrees of rigor and focus – have been conducted, it is fair to say that – Robert Mabro's previous assertion notwithstanding -- there is no consensus on whether financial markets exert a *sui generis* effect on the price of oil and gas.

Generally, formal statistical results on the issue are deemed unimpressive, which is to be expected given the dispersion of trading strategies already reviewed. A 2006 study conducted by the U.S. Commodities Futures Trading Commission concludes that,

> "on average, [managed money trader] MMT participants do not change their positions as frequently as other participants, primarily those who are hedgers. We find that there is a significant correlation (negative) between MMT positions and other participant's positions (including the largest hedgers), and results suggest that it is the MMT traders who are providing liquidity to the large hedgers and not the other way around. We find that most of the MMT position changes in the very short run are triggered by hedging participants changing their positions. That is, the price changes that prompt large hedgers to alter their positions in the very

[16] See "Backgrounder" on CFTC web site http://www.cftc.gov/opa/backgrounder/opacot596.htm.

short run eventually ripple through to MMT participants who will change their positions in response."[17].

Robert Weiner, in a study published in 2006, obtained access to detailed COT data and conducted an analysis focusing on market power and herding. The study concludes that "the evidence indicates that speculators as a group did not herd during the time period for which data are available (mid-1990s). There is evidence, however, that some subgroups of speculators do tend to act in parallel ('flock'), notably commodity pool operators. .. Even among subgroups that flock, the extent of parallel trading is modest."[18]

Another study was conducted by analysts from the International Monetary Fund, which compared the behavior of oil spot prices and the non-commercial positions in three commodities: crude oil, copper, and cotton. The IMF study – acknowledging that COT data had numerous characteristics that hindered definitive analysis –concluded that "[crude oil, copper, and cotton] prices appear less volatile than speculative positions across commodities, with no discernible common trend between prices and speculation. For example, in the crude oil market there has been no persistent pickup in net long noncommercial positions in recent years when oil prices have had a strong upward trend. More strikingly, in the copper market, net positions have actually fallen steadily over the past year, during which prices have reached record highs, suggesting that contrary to common perceptions, speculation may not have played a major role in the recent price run-up."

The IMF study left open, however, the possibility that – for shorter periods of time – there may be a stronger link between the positions of non-commercials and prices: "while the series do not appear to be correlated over the long run, for most commodities some correlation appears to be present over subperiods, as peaks and turning points seem to occur around the same time across the two series."[19]

Some Illustrative Analyses of Financial Market Effects on Oil Prices

If it is unsurprising that simple correlation studies would fail to find a long-term, systematic relationship between oil prices and the changes in trading positions, there remains an apparently large community who appear less impressed with an absence of statistical proof and more impressed with practitioner statements – such as those by Mr. Greenspan and Mr. Mabro – that appear to take for granted that financial markets have a *sui generis* impact on oil prices.

At the most general level, regulators appear to take for granted that "the funds" can affect the markets in which they participate. For example, the U.S. Federal Reserve Board's Patrick Parkinson testified before Congress that "Although the role of hedge funds in the capital markets cannot be precisely quantified, the growing importance of that role is clear. Total assets under

[17] See Michael S. Haigh, Jana Hranaiova and James A. Overdahl, Office of the Chief Economist, U.S. Commodity Futures Trading Commission, "Price Dynamics, Price Discovery and Large Futures Trader Interactions in the Energy Complex," April 28, 2005.

[18] Weiner, *Do Birds of a Feather Flock Together: Speculator Herding in the World Oil Market* (Washington, DC: Resources for the Future Discussion paper, June 2006).

[19] Sergei Antoshin and Hossein Samiei, ""Has Speculation Contributed to Higher Commodity Prices?" in Name of IMF Report, (Washington, DC: International Monertary Fund), pp. 15-18.

management are usually reported to exceed $1 trillion. Furthermore, hedge funds can leverage those assets through borrowing money and through their use of derivatives, short positions, and structured securities. Their *market impact* is further magnified by the extremely active trading of some hedge funds. The trading volumes of these funds reportedly account for significant shares of total trading volumes in some segments of fixed income, equity, and derivatives markets.[20]"

The June 2006 report from the Senate Permanent Subcommittee On Investigations titled "The Role Of Market Speculation In Rising Oil And Gas Prices: A Need To Put The Cop Back On The Beat" cited (in addition to Mr. Greenspan), Citigroup, Goldman Sachs, and eminent energy economist Philip K. Verleger, Jr. as being in the camp of those who believe there is a relationship between financial market activity (specifically, speculation, which is a narrower form of participation than we are reviewing in this paper), and oil prices.[21]

Clearly, given the different ways financial institutions participate in financial oil markets, simple regressions of the market positions of any particular cohort of market participants (including "non-commercials") with price changes are unlikely to be revealing. The trading community is much too variegated to have a simple, measurable effect. The fact is that financial markets offer a variety of participants, each with its own directives and trading strategies. Therefore, the effects of the oil trades of these participants would rarely flow in the same direction. An analysis of the long-term relationships between any particular group of traders and the price of oil or gas, therefore, is unlikely to provide much insight.[22]

More fundamentally, it would be naïve to expect any sustained causation between trading strategies and prices. Some trading strategies are based on the belief that markets eventually maintain fundamental relationships, and trades reflecting that belief can act as stabilizers to the market, and slow a market's adjustment to new developments. Chartists and trend traders, in contrast, can push the market quickly to new levels and can exaggerate price moves. Macro funds provide a linkage between commodity markets and other global investment markets. Fundamental commodity funds may actually enable futures prices to reflect the current expected future outcome, where current publicly available information is inadequate or inadequately distributed.

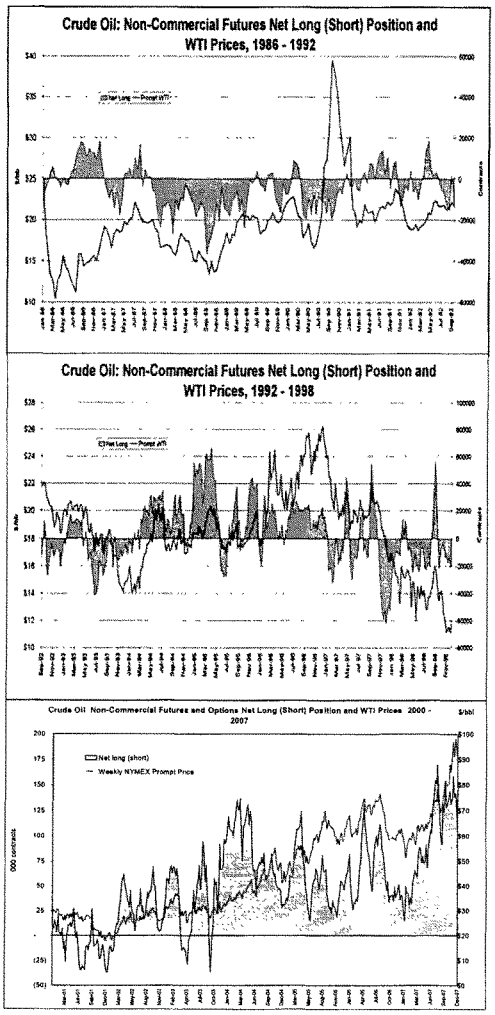
There are, nevertheless, several areas where causation should not be dismissed, all of them consistent with normal economic analysis:

1. *Perfect storm* episodes: there are likely to be periods of time when the condition of the physical energy market and trading strategies of financial market participants are in such good alignment as to produce "herding" and "bubbles" or their opposite, crashes.
2. *Variations on the market power syndrome:* It is possible that the positions of some market participants – index funds as one example – are so large as to constitute witting

[20] Patrick Parkinson, Deputy Director, Federal Reserve Board, Division of Research and Statistics, "The Role of Hedge Funds in the Capital Markets," Testimony Before the Subcommittee on Securities and Investment, Committee on Banking, Housing, and Urban Affairs, U.S. Senate May 16, 2006. Emphasis added.

[21] Coleman [2006], p. 24-25.

[22] Economists call the tendency of traders to engage in similar strategies "herding." Robert Weiner has shown that there is little evidence of systematic and prolonged herding in the financial oil markets.



or unwitting market power. A large-scale infusion or retreat from any of the various positions very large index funds might have price effects. The contract volumes involved in such shifts may -- in the scale of oil trading -- be quite large, but in the scale of money under management by these funds, be quite small. The index funds may be the "elephants in the bathtub" – especially in the long-dated markets.

Analysts have traced developments in total open interest in the WTI futures contract and the price of prompt WTI. At a simple level, the correlation of these two data sets has an R^2 of 0.6 over the entire 1983 to 2006 period. In keeping with a theory that the financial markets occasionally have little impact on oil prices, there are periods (e.g., from 1996 to mid-1999) when there was a very low correlation between them, and other periods (e.g., from January 2001 to October 2006) when the correlation was quite strong (an R^2 of 0.8). These results invite a theory that (1) index funds may be biased to the long side of the WTI contract, perhaps because a long position in oil is used as a hedge against inflation, and (2) they tend to follow trends. That theory holds up quite well during the bull market for oil and other commodities that was evident from 2001 to 2006.

The analysis of the net positions of non-commercials reveals periods of greater and lesser correlation, *as is to be expected* given the dispersion of trading programs. The charts nearby

define a net position as long minus short open interest, and break the 1986-2006 period into three parts:

1. 1986 to 1992, when (except for the period marking the Iraqi invasion of Kuwait and before the onset of the Gulf War that expelled Iraq from Kuwait) WTI was trading in a range of $10 to $20/bbl. During this period, non-commercials were usually net short and their swings from net long to net short appeared to coincide with decreases in the price of WTI.
2. 1992 to 2001: Non-commercials' positions oscillated between net long and net short in long trading cycles that tracked a WTI trading pattern between $14 and $26/bbl. At the end of that cycle, during the period marked by the Asian financial crisis, WTI prices sank to nearly $10/bbl.
3. 2002 to 2007: a great and extended bull market, beginning from the depths of the Asian economic crisis, brought oil prices from $20 to $100. The non-commercials were usually on the long side of this trend. Open interest in the WTI contract rose rapidly during this period. Anecdotal evidence indicated new money from index and pension funds, pulled into oil markets by financial advisors urging their clients to increase their long exposure to commodities. This inflow would have helped to accelerate the oil price increase. Their high rates of return in 2004 and 2005 fed the impulse of other funds to get on the long side of oil. This trend continued into 2006 and 2007. When it appeared towards the end of the year that the long bull market was over, funds rapidly bailed out of their positions, accentuating the downward pressure on prices which pushed prices back towards $80/bbl towards the end of the year.[23]

In these charts, the visual correlation between the net positions of the non-commercials and the price of WTI occasionally supports a conjecture that sudden changes in the preferences of speculators may be among the causes of changes in the price of oil.

A third approach to the study of the effects of financial energy markets is to evaluate the relationship between the spread positions in the NYMEX WTI contract and the price of WTI. The volume of spread trades has increased enormously, and now outweighs the number of outright trades. It is interesting to observe that there is a high positive correlation (R^2 of 0.86) between the amount of open interest in spread trades (futures and options) and the price of WTI. Without knowing more about the structure of the time spreads (a study that goes beyond the scope of this report but which might yield some interesting results), it is difficult to know exactly what the implication of this correlation is.

Having reviewed these issues, it is important to note that neither hedge funds nor any other cohort of the speculator community are infallible. There are limits to the ability of

[23] It is important to note that the charts match *weekly* COT data with the price of prompt (first month) WTI. Correlation statistics are highly sensitive to the time period chosen, which is consistent with a theory that the influence of financial markets on oil prices waxes and wanes. The inter-relationship between events in the physical market and financial markets are extremely complex.

speculators not only to anticipate but also to influence markets. While WTI is an excellent vessel for holding traders' fears and hopes, the very complex dynamics of global crude oil physical demand and supply exerts itself inexorably, albeit opaquely (because of the highly imperfect state of world crude supply and demand data).

There is an inclination, especially among traders, to assume "the financial market is always right." The record clearly shows, however, that speculators are far from infallible. As the example of Amaranth (and its predecessors like Long Term Capital and Metallgesellschaft), they often make mistakes. Their mistakes are visible both in outright and in spread trades. [24]

ESAI has maintained a proprietary database of crude oil supply and demand (aka, refinery intake of crude oil) since 1984. It has developed several metrics of the condition of global crude oil supply and demand. One of those metrics, ESAI's "Crude Balance," which measures the surplus or deficit of crude supply versus demand, indicated for the winter and spring of 2003 that, while the speculators were aggressively short-selling WTI, the global fundamentals were quite tight. At the same time, there were plenty of political issues (tensions in the Middle East, deteriorating supply conditions in some exporting countries) that were keeping market participants – with the exception of speculators in the WTI market – extremely apprehensive. Thus, the spring of 2003 represents a case where "the non-commercials" had a bearish view of the market, but "the fundamentals" drove the market the other direction.

REGULATORY IMPLICATIONS

Our ongoing evaluations of the ebb and flow of demand and supply in financial energy markets has caused us to focus particularly strongly on the activities of professional speculators. Speculators, such as commodity funds, move in and out of the oil markets for reasons that may have nothing to do with oil (e.g., because a trading program has noted an historic propensity for oil to move one way when pork bellies move another). It is possible that a sudden decline in demand for paper barrels – occurring because one or more large players suddenly decides to abandon oil as a financial instrument – causes a decline in paper oil prices that quickly reduces the value of physical barrels.[25]

Given this review, it appears to me that – largely because of data quality issues -- the effects of financial markets on energy prices is (to return to Gregory Treverton's useful distinction) a mystery rather than a puzzle. As such, it is a problem that more amenable to an "intelligence" approach to analysis (as in the Central Intelligence Agency), than to a purely statistical approach. Because of the global complexities of both the physical and financial energy markets, it is unsurprising that purely statistical analysis of the relationship between specific data sets (such as the open interest of non-commercials) and energy prices.

[24] Amaranth reportedly lost $3 billion in a period of a few months by trading in the hyper-volatile U.S. natural gas market For an account, see "Betting the House and Losing Big," *The New York Times*, Sep, 23, 2006.

[25] Newspaper accounts in January 2007 indicated that "Wall Street commodity funds that have been investing heavily in energy futures are now loading up on agricultural commodities like corn and livestock futures." See "Wall Street is Betting on the Farm," *New York Times*, January 19, 2007.

How can energy market participants anticipate large and sudden shifts in the financial energy markets? Not easily. At first glance, COT futures data tell a simple story: there is always a short for every long. As the volume and open interest change, then the long and short positions taken by commercials, non-commercials, and small traders change from day to day and week to week. As with physical market data, the COT data are imperfect at best. They are simply clues in a complex detective story. Why did non-commercials increase their short positions? Why did commercials and/or small traders do the opposite?

We agree with Mr. Greenspan and others who believe organized speculators now affect the value of many of the assets involved in world trade. No one would object to this if only soft drink prices were affected by their activities. But when they drive up the price of the fuels that keep people from freezing, of the equities that hold the store of wealth of savers, and of the currencies that determine a nation's stature in world affairs, it is no wonder that we hear cries of alarm from government officials.

In the United States, calls for reform of the rules governing speculation tend to focus on two issues: *greater disclosure* and *larger margin requirements*. On the disclosure front, the U.S. Commodities Futures Trading Commission, during the tenure of the Bush Administration, has been disinclined to apply futures-style disclosure requirements on the burgeoning over-the-counter market.

The implosion of Amaranth, however, has rekindled calls for greater disclosure.[26] The most prominent specific measure that has surfaced in Washington, DC is the "Oil and Gas Traders Oversight Act of 2006."[27] The act – only two pages in length – simply requires that "The [CFTC] Commission shall prescribe rules requiring such regular or continuous reporting of positions in a *reportable contract* in accordance with such requirements regarding size limits for reportable positions and the form, timing, and manner of filing such reports under this paragraph, as the Commission shall determine." A *reportable contract* is defined as "a contract, agreement, or transaction involving an energy commodity, executed on an electronic trading facility, or a contract, agreement, or transaction for future delivery involving an energy commodity for which the underlying energy commodity has a physical delivery point within the United States and that is executed through a domestic terminal."[28]

Critics of this legislation contend that such disclosure will simply cause the trading activity to migrate away from the United States. This seems disingenuous: one of the reasons these markets use American futures contracts as benchmarks is because they have faith in the underlying integrity of the American financial system, in comparison with the alternatives. There seems to us to be no compelling reason not to require such reporting, at least for US-centered trade, and for European and Asian regulators to implement similar reporting programs.

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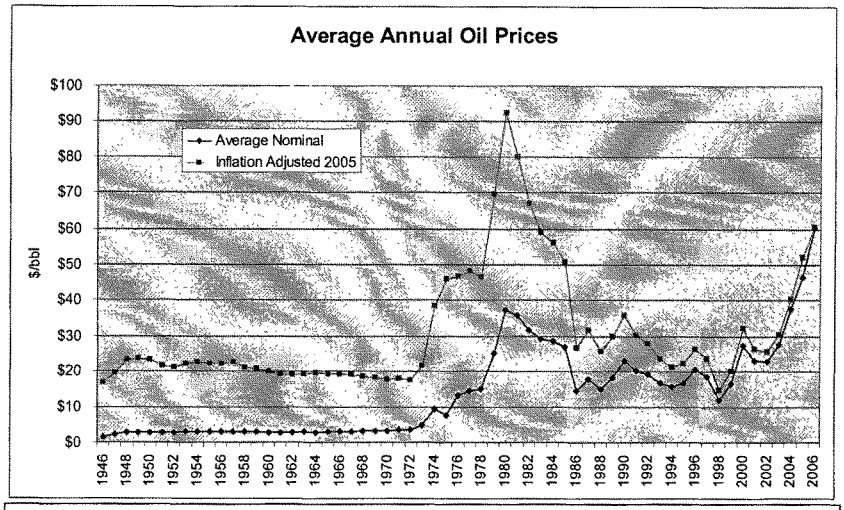
[26] See in particular, Coleman and Levin, *The Role of Market Speculation In Rising Oil and Gas Prices: A Need To Put the Cop Back On the Beat*, Staff Report, Permanent Subcommittee on Investigations, U.S. Senate, June 27, 2006, page 3.

[27] The influential business journalist of the *New York Times*, Gretchen Morgenson, called for passage of the Act in a September 24, 2006 article titled "Dangers of a World Without Rules."

[28] *Oil and Gas Traders Oversight Act of 2006*, available at http://thomas.loc.gov/cgi-bin/query/z?c109:S.2642:.

On the issue of *margin requirements,* we believe the influence of speculators cannot be eliminated without throwing the baby – the efficacy of market forces – out with the bath water. Government officials and most well-informed market participants are aware that markets cannot thrive without the depth and liquidity speculators add to markets, without speculators to embrace the risk that others shun, and without speculators' restless pursuit of new financial instruments that – in spite of all of the concern about derivatives – still promote financial flexibility and creativity. In short, speculators make markets work better, albeit at a cost.

The cost, as both the academic literature and practitioners recognize, is greater volatility. Markets with higher concentration of professional speculators tend to exhibit greater price volatility. In the short run, say, over a couple of months or at most a few years, this volatility is



Source: http://www.inflationdata.com/inflation/Inflation_Rate/Historical_Oil_Prices_Table.asp

inconvenient and even painful to those on the wrong side of the price cycle. Thus, the relatively high oil prices of 2002 to 2006 were painful for consumers, the low price of 1998 for producers.

In the long run, however, we find that commodity prices and exchange rates in freely traded markets tend to return to an economically rational level. Thus, oil prices – thought in the late 1970s and early 1980s to be on a constantly rising path – in fact showed a remarkable propensity to return to a very long-term average level of around $25 per barrel, as shown in the chart below, which depicts oil prices since 1946 in inflation-adjusted terms. After 2000, the price ratcheted up to levels not seen (in real terms) since the 1980 oil crisis. It appears from our analysis that the increase in demand for paper oil barrels over the past several years helped to drive those prices up. But if we have learned one thing about commodity speculators over the

years, it is that they are quite willing to trade a commodity down as well as up. Thus, if the fundamentals of oil – the supply curve, the levels of demand, and inventories – conspire to drive short-term prices back down to that long-term $25/barrel level, speculators will ultimately help to get it there.

If the desire to regulate speculators further cannot be restricted to just additional disclosures, the most direct and effective measure would be to reduce their leverage by *increasing the margin requirements in exchange traded markets*. Funds and exchanges, of course, will resist this suggestion because it would adversely affect the liquidity of their markets. And so it would, but if this segment of the financial community does not regulate itself more effectively, chances increase that governments will ultimately regulate them, perhaps out of existence.

It behooves the defenders of the new *status quo* – market economists, investment bankers, and Fund managers – to do everything they can to shed maximum light on these markets. There is still an astonishing lack of disclosure of some of the information that helps make market forces explicable. Until January 2007, for example, only the American futures markets were required to collect commitment of traders data. In the future, it is likely that OTC markets will have to do so[29]. Such vital market information as petroleum inventory levels are still not published in a timely basis by the leading oil producing countries. Saudi Arabia, the world's largest oil producer, fails to publish any timely details of its operations[30].

Thriving markets have an insatiable appetite for information. It is up to governments – the same ones that have surrendered some of their controls to the market – to ensure that adequate flows of information exist to feed the markets to which they have entrusted their fates. Governments must insist that those who sell critical commodities and associated financial services – whether it be Saudi Arabia or ICE or NYMEX – disclose enough information to ensure that known abuses (like insider trading), and preventable problems (like development of market power by an aberrant single hedge fund or herd of funds) do not fatally undermine the efficacy of the markets. At the end of the day, markets exist because governments allow them to. Support for oil, gas, and electricity markets is ebbing, inside and outside the United States, and advocates of markets as the best way to organize energy activities must do all they can to shore up that support.

[29] On January 30, 2007, *Platts Energy Trader* reported that ICE was reporting large gas trading positions to the FTC on a daily basis.

[30] See, however, www.JODIDATA.org for information about the Joint Oil Data Initiative, which is headquartered in Saudi Arabia.

Prepared Testimony of
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to

The Permanent Subcommittee on Investigation of the U.S. Senate
Committee on Homeland Security and Governmental Affairs
and
The Subcommittee on Energy of the U.S. Senate
Committee on Energy and Natural Resources

December 11, 2007

Mr. Chairman, members of the Subcommittee on Investigation and the Subcommittee on Energy, it is my pleasure to discuss today developments in world oil markets. In my testimony, I will briefly describe the market changes that have occurred this year and then explore some of the widely cited explanations for these changes. My analysis leads to the following conclusions.

First, the rise in light sweet crude prices to almost $100 per barrel in November came about because the U.S. Department of Energy has been removing a significant share of the daily volume of this type of crude from the market for storage in the Strategic Petroleum Reserve. The volumes have amounted to as much as 0.3 percent of the global supply of light sweet crude available. DOE's actions may have added as much as 10 percent to the light sweet crude price, given the very low estimated price elasticity of demand for crude and the likely even lower price elasticity of demand for light sweet crude. This conclusion is supported by the fact that producers of sour crude oils such as Saudi Arabia have had to institute price cuts of as much as $10 per barrel for sour crude.

Second, prices have been pushed higher because private firms have been reducing inventories. Over the last six months, U.S. refiners liquidated as much as 50 million barrels of crude oil stocks. This liquidation occurred because holding stocks was no longer profitable. The decline in profitability can be traced to the turmoil in financial markets and to greater sophistication on the part of investors who acquire commodities as an asset class. The change in profitability makes it almost impossible for OPEC to inject additional oil into inventories owned by private companies even if commanded to do so by the Secretary of Energy and the International Energy Agency's Executive Director.

Third, light sweet crude demand has been boosted by new environmental regulations requiring the removal of almost all sulfur from diesel fuel sold in the United States, Canada, and Europe. The need to manufacture diesel containing less than 10 parts per million of sulfur for sale to motorists and truckers—and soon other diesel users—creates an op-

erating hurdle for refiners that is more easily met with low-sulfur crudes. This has created added demand for light sweet crude.

Fourth, the price rise cannot be explained by international events such as the dispute between Turkey and the Kurds or concern over Iran's nuclear program. To the contrary, the international scene has become calmer, as demonstrated by the declining American casualty rate in Iraq. All things being equal, prices would have decreased if the only recent change was one experienced in the international arena. As I suggest below, there is no risk premium for crude.

Fifth, the current oil price increase has not been spurred by speculation.

I conclude by suggesting that Congress and the Bush administration could change the current market environment by altering the management of the strategic reserve. A policy where storage of sour crudes is accelerated and stocks of light sweet crudes sold off would allow the United States to fill the strategic reserve faster and relieve some, if not all of, the upward pressure on crude prices. Ultimately, this strategy would leave the U.S. SPR with a billion or more barrels of sour crude that almost all refiners could process. However, it would also require relaxing certain EPA regulations during a severe emergency, as was done after Hurricane Katrina.

Background

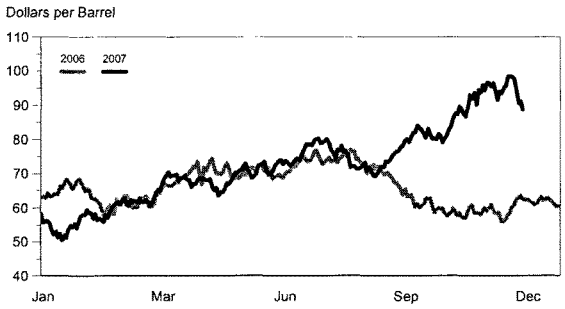
Oil prices in 2007 closely tracked oil prices in 2006 through the first eight months of the year. As can be seen from Figure 1 (page 3), there was almost no difference in prices between 2006 and 2007 from February 1 to August 15.

I should note that the WTI prices shown in Figure 1 for January 30, 2007, through July 25, 2007, are not the cash prices published by *Platts* or *Petroleum Argus*. Rather, they were generated by taking Dated Brent prices and adding the traditional spread between WTI and Brent of $1 per barrel. The adjustment is required because the Cushing WTI market faced a unique and very local problem from February to July due to a fire that closed Valero's McKee refinery. The McKee refinery is located near the West Texas fields and historically has processed West Texas Intermediate crude. For the managers of that refinery, WTI is not just a paper concept, it is real oil. When fire shut the refinery, Valero reversed a pipeline, injecting more light sweet crude into Cushing and depressing WTI prices by as much as $8 per barrel relative to Brent.

I will add that such market anomalies are not unusual. Wyoming produces a very sweet crude that, due to logistical constraints, goes only to refineries in Colorado and Wyoming. Normally, Wyoming Sweet trades at prices close to WTI. However, in 2006 Wyoming Sweet traded at a discount of as much as $30 per barrel to WTI when a large refinery in Colorado was closed for maintenance.

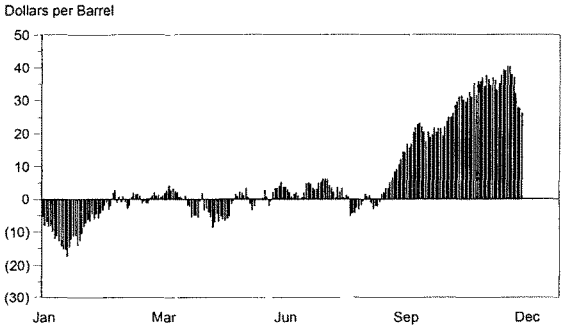
The message to take from Figure 1 is that 2006 and 2007 markets were very similar until mid-August. After August 20, though, markets changed. Figure 2 captures the magnitude of the shift. The graph shows the difference between prices in 2006 and 2007. By my reckoning, the recent price increase ranks as one of the three or four largest jumps in crude prices over a short period of time in the last 30 years. The other increases of a similar magnitude occurred during the Iranian Revolution, Iraq's invasion of Iran a year later, and Iraq's 1990 invasion of Kuwait. The current increase is that large.

Figure 1
Daily WTI Prices in 2006 and 2007*



Note WTI prices between January 30, 2007, and July 25, 2007, have been adjusted to remove the impact of a Valero refinery fire (see text)
Source Platts, PKVerleger LLC

Figure 2
Difference between WTI Prices in 2006 and 2007



Source Platts, PKVerleger LLC

With this background, it is important to ask what happened to oil markets. In other words, what factors can explain the sudden price rise that puts 2007 on par with 1979, 1980, and 1990?

International turmoil does not explain the price rise.

Economic historians looking at these markets 15 or 20 years from now will no doubt begin by trying to find international events that could have triggered the 2007 price rise. They will find a few tidbits. For example, market analysts rushed to cite Turkey's threat

to invade the Kurdish area of Iraq as an explanation. Others pointed to rising tensions between the United States and Iran as a cause.

However, these explanations simply do not hold. Turkey's threat to invade Iraq is not on par with Iraq's invasion of Iran. It's not even close. Furthermore, the tensions between the United States and Iran cannot explain an almost 50-percent hike in crude prices. No, the typical blaming of international events does not work this time.

I will go further. Often, one hears analysts speak of a risk premium in oil prices. Today, there is no risk premium. Indeed, I doubt there ever has been a risk premium in the price of oil.

Growing demand in India and China also does not explain the price rise.

Future economic historians seeking to explain the 2007 price increase will likely turn to the prospective consumption growth in China and India as a reason for the oil price surge that began in August. Some will no doubt find that the prospect of smaller increases in output from countries such as Venezuela, Russia, and Kazakhstan added further upward pressure to prices.

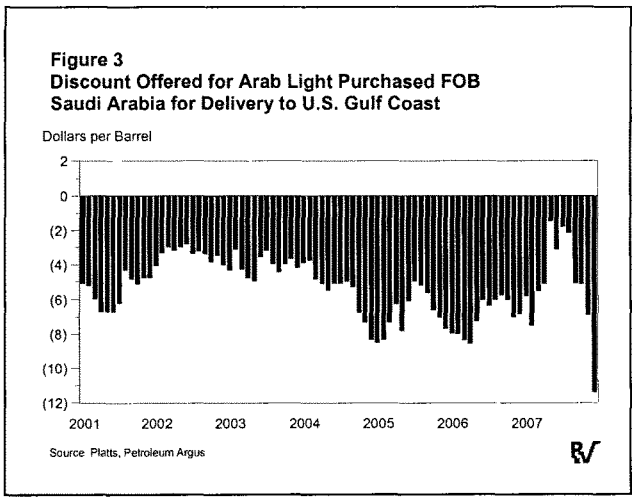
These arguments will have great appeal. However, they will fail again because no great revelation regarding China, India, or Russia appeared in August 2007. The Energy Information Administration (EIA), the International Energy Agency (IEA), the National Petroleum Council, and others have been issuing warnings regarding these countries for years. While new information keeps emerging gradually, nothing startling came out this summer. Hence, it is hard to attribute the sudden price boost to oil buyers waking up to the fact that the global economy was expanding and oil use was rising.

One cannot attribute the price rise to a global crude oil shortage.

It may surprise many to discover that some oil producers have had a difficult time selling their crude this fall. One indication of their problems can be seen in the differential between crude oil sold by Saudi Arabia and WTI. Saudi Arabia prices the crude it sells to U.S. customers off WTI prices. Each month the Saudi oil company, Aramco, announces a differential to WTI for firms buying Saudi crude for delivery to the United States in that month. For example, buyers lifting Arab Light Crude from Saudi Arabia this month will pay the WTI price that prevails 50 days from now less $11.65. (The delay allows for the oil's transit time from Saudi Arabia to the United States.) Aramco adjusts this differential every month to reflect changes in market conditions.

As can be seen from Figure 3 (page 5), the differential set by Saudi Arabia for oil loaded in August was $2.15 per barrel. Five months later, the Saudis boosted the discount to $11.65. As every shopper knows, discounts do not deepen when supplies are tight. Rather, they increase when goods do not sell. Apparently, Saudi Arabia has been having trouble selling its oil.

The repeated hikes in the Saudi discount seem to undercut the calls for OPEC countries to boost production coming from energy officials, such as Secretary Bodman, in consuming countries. The cuts suggest a seller—like a department store—trying to move unattractive product.



Speculation does not seem to explain the price rise. To the contrary, "speculation" may have declined as prices rose.

Speculators have been the villains in commodity markets for over 100 years. Williams notes the frequent attack on speculators in agricultural markets in a number of his papers.[1] Even today, one hears again and again of farmers complaining about speculators.

However, to blame speculators is to blame "the man behind the tree," the man who is not really there. (Senator Russell Long of Louisiana often used this line: "Don't tax me; don't tax you; tax the man behind the tree.") Many of market participants who might be described as speculators are really investors—individuals or funds trying to earn a return for themselves or constituents such as retirees. Over the last two decades, an extensive literature on commodities as an asset class has emerged. Experts on finance assert that commodities are an asset class and suggest that investors diversify their portfolio between equities, debt, and commodities. Some large pension funds have gone further. The California Public Employees Retirement System, for example, puts a portion of its assets in physical commodities, and Harvard owns forests in its endowment.

Many investors put money into commodities by purchasing futures, prompted by research that shows that commodity futures outperform equities in firms that own energy and other commodity resources. These investors have been guided by academics such as Gary Gorton and Geert Rouwenhorst.[2] Last December, OPEC and the EU convened a meeting of experts to discuss the impact of this development. I and four other U.S. citizens were

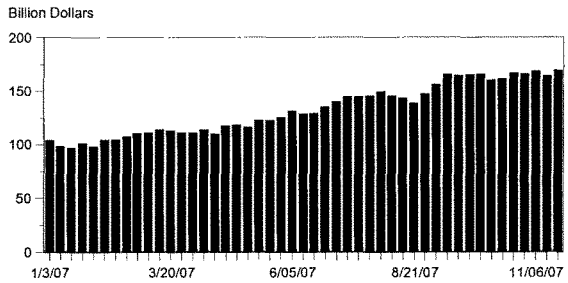
[1] See, for example, Jeffrey C. Williams, *The Economic Function of Futures Markets* (Cambridge, England: Cambridge University Press, 1985).
[2] Gary Gorton and Geert Rouwenhorst, "Facts and Fantasies about Commodity Futures," *Financial Analysts Journal* 62, No. 2 (2006).

invited to speak. Tragically, no official from the U.S. government joined representatives from the IEA, the EU, OPEC, and various governments of OPEC and EU members.

However, the Commodity Futures Trading Commission (CFTC) has noted the emergence of commodities as an asset class. Beginning in January, the CFTC has reported data on agricultural futures contracts held by investors. These data allow one to estimate the money invested in commodities—and the money invested in oil futures. In Figure 4, I show the total amount invested in commodities by this new group of participants. The approach used to back into the calculation is explained in Appendix A, which reproduces a report I issued in January.

Figure 4 shows the amount invested in commodities has increased from $100 billion in January to $170 billion at the end of November. Note that most of the growth occurred before the middle of August, that is, before crude prices started their remarkable rise.

Figure 4
Estimated Amount Invested in the Two Principal Commodity Futures Asset Instruments



Note The two instruments are the S&P GSCI and the Dow Jones-AIG indexes
Source PKVerleger LLC

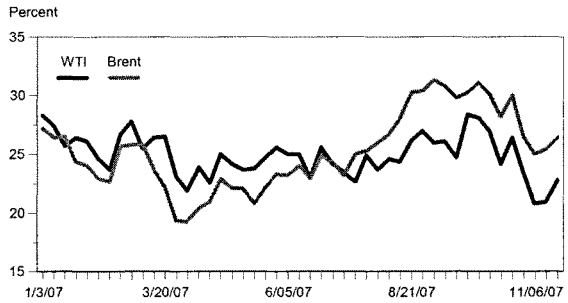
The CFTC data also allow one to calculate the percentage of open interest in crude oil or petroleum product futures contracts held by investors in these commodities. (Again, the basis of the calculation is explained in Appendix A.) Figure 5 (page 7) shows the movement of this percentage from beginning of the year. Note that the share rose during the early summer and then *declined* from the end of September. This suggests that commodity investors had a *diminishing influence on oil prices as prices rose.* This is hardly the empirical result one would expect if speculators were really causing the price increase.

Lastly, we show in Figure 6 (page 7), the rise and fall in open interest in the three principal crude oil futures contracts: NYMEX Light Sweet Crude (also referred to as WTI), ICE Light Sweet Crude, and the International Petroleum Exchange Brent Crude contract. The graph extends from 1991 to November 20, 2007. Data are shown as of each Friday. I note that open interest peaked at the end of September at almost three million contracts and has since dropped to 2.5 million contracts. The decrease in October and November is hardly consistent with a hypothesis that attributes the price rise to speculation. To the contrary, the data seem to exonerate speculators.

Changes in expectations do not explain the price increase.

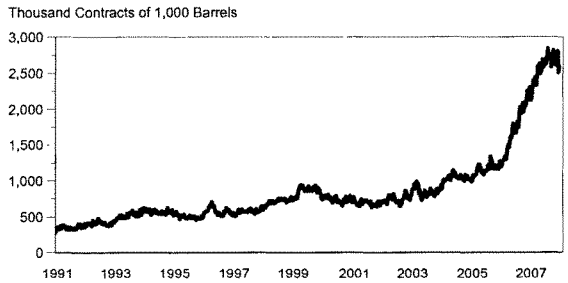
Expectations often determine the actions taken in markets. For example, owners of a nonrenewable resource may be willing to produce for $10 if prices are expected to be $10 in five years. On the other hand, they will be disinclined to produce today if prices in five years are expected to be $100. Instead, they may well sell future production for $100 and wait. In such circumstances, consumers will bid up current prices to a level that will encourage output if the production is needed.

Figure 5
Percentage of Open Interest in WTI and Brent Futures Accounted for by Investment in Two Principal Commodity Indices



Source PKVerleger LLC

Figure 6
Total Open Interest in Three Principal Crude Futures Contracts, January 1991 to November 2007



Note The three contracts are the NYMEX Light Sweet Crude contract, the ICE Sweet Crude contract, and the IPE Brent contract
Source NYMEX, ICE, IPE

Markets today show good indications of expectations. Share prices of royalty trusts, for example, tend to provide a useful guide to changes in expectations because buyers are paying for a stream of income represented by payments for oil. Under specific circumstances, the share prices of these instruments represent an unbiased view of the likely trend in future prices. Furthermore, increases in these share prices will indicate changes in expectations that may require increases in cash prices.

One widely observed instrument is the BP Prudhoe Bay Royalty Trust (BPT). The trust was created in 1989 by BP. Its shareholders receive 16 percent of the first 90,000 barrels

per day of royalty production from the Prudhoe Bay Unit. Movement in share prices measures the shifts in market expectations of future oil prices. Empirical research has demonstrated that predictions derived from the trust have been systematically more accurate than projections generated by other approaches, including those employed by DOE. This finding is not surprising because those investing in the trust have more at stake financially than model builders do.

Figure 7 shows the daily movement in the BPT share price from January 2006 through November 28, 2007. Inspecting these data reveals the absence of any real trend. While detailed modeling of the trust suggests investors expect prices to be slightly higher in, say, 2020 than they did a year ago, the changes are probably within the margin of error. The basic message, then, is that expectations regarding the long-run oil price have not changed much.

Figure 7
Share Price of the BP Prudhoe Bay Royalty Trust as an Indicator of Expections of Long-Run Oil Prices

Source PKVerleger LLC

This finding may come as a surprise. Recently, the International Energy Agency issued a warning regarding future supply-and-demand imbalances in conjunction with the release of its 2007 *World Energy Outlook.* The study's clear implications were that IEA economists had much different and higher expectations for future prices in 2007 than they did in 2006. Investors do not seem to have reached such a conclusion. As can be seen from Figure 7, BPT share prices have been stable.

Oil company decisions to liquidate stocks may have exacerbated the oil price rise somewhat.

Inventories are the most misunderstood economic phenomenon in the energy business. Time and again, one reads statements by energy policy officials commenting on low stocks. Invariably, these officials call on OPEC to boost output so stocks will rise. The economic ignorance displayed in these appeals is appalling.

My favorite quote appeared in November. While attending the World Energy Congress, U.S. Energy Secretary Bodman called on OPEC to boost oil production. As the November 13 *Financial Times* reported, "Samuel Bodman, the U.S. energy secretary, urged

OPEC on Tuesday to raise production at its weekend summit. He said the price of oil was at such high levels in part because developed countries' stocks were below their five-year averages."[3] The story then continued:

> But Mr. Bodman told reporters at the World Energy Congress in Rome: "I have asked that that be reconsidered. I have asked them to increase production." He said he was trying to draw OPEC's attention to the fact that the inventory numbers were "troubling."[4]

Bodman's statement makes it sound as if commercial inventories will increase if OPEC boosts production. But doesn't something else have to happen for this to occur? Don't companies have to agree to buy the oil? Suppose, given the current financial crisis, that companies choose not to buy the oil? What happens then?

The data demonstrate that companies accumulate incremental stocks oil only if it is profitable to do so. Since May, it has not been profitable. Since May, companies have been dumping stocks. This story is told with two charts.

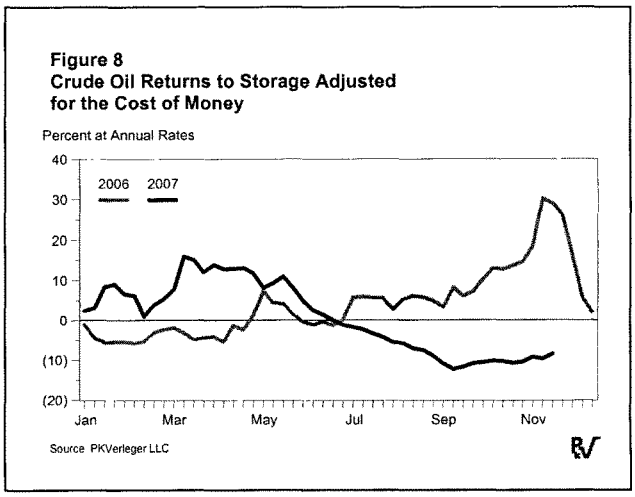


Figure 8 shows data on "returns to storage" for crude in 2006 and 2007. Returns to storage will be a new concept here because, to my knowledge, neither the Energy Information Administration nor any other organization follows the idea. However, the concept goes back to John Maynard Keynes, who, whatever his other vices, was one of the world's great commodity traders. Returns to storage measure the financial return earned by purchasing a physical unit of a commodity, selling a future for delivery at a later date, and storing the commodity. If, for example, one buys crude for $50 per barrel and sells a future for delivery a year hence at $100 per barrel, one earns a return of 100 percent. The trade, referred to as cash and carry, can be very profitable.

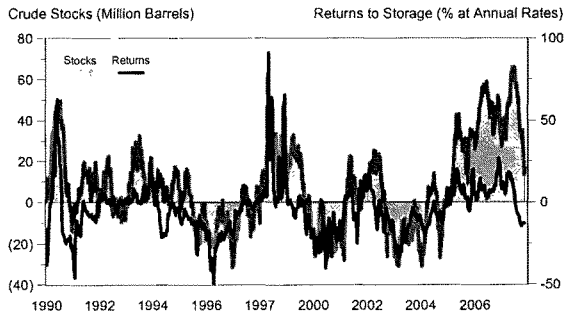
[3] Ed Crooks and Javier Blas, "U.S. Urges OPEC to Raise Production," *Financial Times*, November 13, 2007.
[4] Crooks and Blas.

Rumor has it that Keynes once filled the basements of several colleges with wheat when the returns were really high.

Figure 8 shows that returns to storage for crude oil were positive through the second half of 2006 and the first half of 2007. Since the end of May 2007, though, returns have been negative. Logically, one would expect stocks to have accumulated during the second half of 2006 and the first half of 2007 and then be liquidated from June 2007 forward.

The data on inventory accumulation and liquidation confirm this hypothesis. Figure 9 shows that stocks tend to rise with positive returns and decline when returns are negative. Figure 9 shows the deviations of U.S. inventories from trend from 1990 to 2007. (Note: during this period, we have observed a steady decline in the "normal" level of inventories held by commercial firms. This decrease is explained by improved operating efficiencies in the sector.)

Figure 9
Deviation from Trend of Commercially Held Crude Stocks, 1990 to 2007, vs. Returns to Storage Adjusted for the Cost of Money



Source PKVerleger LLC

As can be seen from Figure 9, stocks decline when returns fall below zero while tending to rise when returns are positive. The explanation for this effect is quite simple. Financial officers of firms holding oil stocks have a wide number of options. They can invest their cash in commercial paper, Treasury bills, or inventories. They can even borrow to acquire additional stocks. Their decisions are driven by the returns offered by various instruments.

This finding, while intuitively obvious, seems to have escaped many who follow the oil market. Recently, though, the financial market's effect on oil and the rest of the economy has become painfully apparent. In particular, the subprime crisis has caused many lenders to withdraw from the commercial paper market. In turn, the cost of borrowing has increased, raising the cost of holding oil stocks. At the same time, buyers who had lifted forward prices to a premium over cash prices have liquidated positions, in part to obtain cash. This has made it expensive to hold inventories and so stocks have dropped.

Econometric research on the relationship between inventories and price spreads suggests the stock reduction caused by the financial crisis may have added a dollar or two to crude

prices. In other words, the stock decline tied to the financial problems explains a small part of the $30 price rise.

Conclusion: The rapid climb in oil prices since August cannot be explained by any of the traditional factors.

International events certainly did not push prices higher. If anything, they forced prices lower. Expectations of strong future growth in consumption did not change markedly after August and thus also must be rejected as a cause of the price rise.

Speculators also do not seem to have played a role in the run-up from $70 to $98 per barrel. Passive investors who buy commodities as an alternative asset class may have reduced ownership of oil as prices rose if they maintained a diversified portfolio and followed the formulas recommended by Goldman Sachs or the managers of the Dow Jones-AIG index. Financial turmoil since August would have further discouraged investors.

Expectations regarding future oil prices also did not change significantly.

Only shifts in inventory management and option hedging could have contributed to the price rise. But these influences certainly cannot explain a $30-per-barrel increase. Indeed, it is difficult to ascribe more than $5 of any increase to these factors.

By deduction, then, the cause of the increase must lie elsewhere. The one and only significant change was DOE's decision to begin filling the Strategic Petroleum Reserve.

After more than a year and a half of inaction, the Department of Energy renewed its program to fill the SPR. On August 23, 2007, DOE acquired 97,973 barrels of light sweet crude. Deliveries continued through November, with 5.2 million barrels of crude delivered. An additional 2.2 million barrels were projected to be delivered in December and January.

The mix of crude going into the SPR was approximately 33 percent sweet and 66 percent sour. Table 1 (page 12) presents the details, including type of crude, month of delivery, and total.

As can be seen from Figure 10 (page 12), the oil volumes held in the SPR have increased sharply. The fluctuations in the amounts stored correspond to the surge in crude prices. Indeed, reviewing the history of 2006 and 2007, DOE's action appears to be the single major activity that differentiated 2007 from 2006. Yet despite the evidence, DOE has continued to deny responsibility for the price rise. Indeed, Secretary Bodman seems to have a penchant for belittling such claims without bothering to examine the facts. Recently *Platts* quoted him as calling "the current fill rate, which moves an average

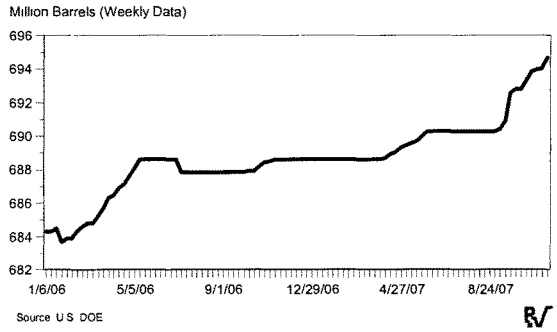
55,000 b/d of royalty-in-kind oil into the reserve, 'modest.'" The Secretary also said, according to *Platts*, that the fill program "'does not materially' lift the price of oil."[5]

Table 1. Rate of Fill for the U.S. Strategic Petroleum Reserve, August 2007 to January 2008

	Sour Crude (Barrels)	Sour Crude (Barrels per Day)	Sweet Crude (Barrels)	Sweet Crude (Barrels per Day)	Sulfur Content of Sour Crude (%)	Sulfur Content of Sweet Crude (%)
Aug 2007			166,273	11,085		0.37
Sep 2007	1,895,017	63,167	472,749	15,758	1.26	0.34
Oct 2007	547,018	17,646	781,375	25,206	1.37	0.34
Nov 2007	1,103,514	36,784	278,779	9,293	1.05	0.28
Dec 2007	2,000,000	64,516	1,000,000	32,258	1.46	0.32
Jan 2008			250,000	8,065		0.28
Total	5,545,549	40,776	2,949,176	21,685		
Rate of Fill – January through June 2008				39,200		

Source: Communication from Committee Staff from data supplied by U.S. DOE.

Figure 10
Crude Stocks Held in the U.S. Strategic Petroleum Reserve in 2006 and 2007



The Secretary's statement might be correct if DOE were adding only sour crude to the reserve. Sour crude, as noted above, is in surplus. However, more than a third of the oil added to the SPR is light sweet crude. Today, sweet crude constitutes less than one quarter of the world's supply and probably less than one half of this production is available to the market. Thus DOE is taking more than a "modest" amount of the available sweet crude from the market. Indeed, the market impact may be significant given the very low price elasticities of demand for crude, especially light sweet crude.

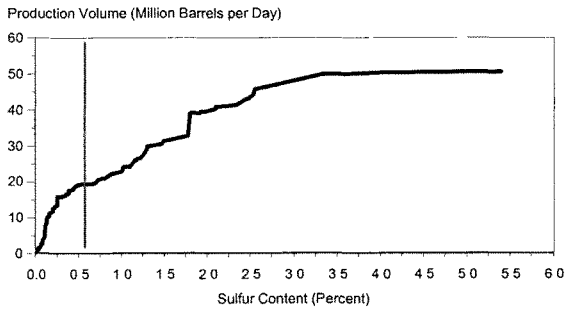
The empirical impact of DOE's actions on light crude prices depends on several factors, including

[5] *Platts Global Alert*, November 8, 2007.

- The size of the market for sweet crude,
- The ability of consumers to substitute sour crude for sweet crude, and
- The price elasticity of demand for sweet crude.

The size of the sweet crude market may be as large as 20 million barrels per day or as small as five million barrels per day. Figure 11 shows the distribution of the global crude market by sulfur content. The data are taken from the Energy Intelligence Group's *International Crude Oil Market Handbook.* As can be seen from Figure 11, EIG identified a total of 20 million barrels per day of global production as having a sulfur content of 0.5 percent or less. It is this output—and not total world production—that must be used to measure market size.

Figure 11
Cumulative Distribution of Global Crude Production in 2006 as Reported by Energy Intelligence Group



Source Energy Intelligence Group

However, a significant portion of the 20 million barrels of light sweet crude production is captured under long-term supply arrangements and thus not available to DOE or to the firms that might want to replace the light sweet crude they would have otherwise received had DOE not acted. Some light sweet crude is produced in China, for example, and stays in China. Some light sweet crude is tied permanently to Asian consumers, while other volumes are linked directly to European refiners. Thus the pool of oil from which DOE is pulling may be smaller than five million barrels per day. This means DOE may be taking between 0.1 and 0.5 percent of the light sweet crude from the market.

This supply cannot be replaced. Middle Eastern countries can raise production of sour crude to compensate for increased demand tied to the SPR filling. There is, in contrast, no surplus capacity to produce light sweet crude. DOE is shrinking the market.

The price impact of removing light sweet crude from the market depends in part on the ability of refiners to replace sweet crude with sour crude. In theory, refineries are flexible. The best ones should be able to substitute crude oils with higher sulfur content for the lost supplies of sweet crude. However, new regulations limiting the sulfur content of diesel fuel bring this assumption into question. Recent reports by the International

Energy Agency suggest these requirements make it much more difficult for refiners to substitute sour for sweet crude. In particular, desulfurization units at refineries often limit the amount of product that can be made. This means product volumes are lost when sweet crudes are removed from markets. Regulations requiring the reduction of sulfur in diesel fuel appear to impose especially severe constraints on refiners.

Refiners and traders have stated privately that light sweet crude is particularly valuable given new regulations limiting the sulfur content of gasoline and diesel fuel. However, other than a few mentions in the *IEA Monthly Oil Market Report*, very little has been written on the intrinsic value of light sweet crude.

In one private arbitration, refining engineers explained that light sweet crude was of particular value because it could be taken to the distillation unit directly and thus did not clog units that pretreated heavier, sourer crudes. In addition, the engineers explained that more crude could be processed and more product could be made in facilities where desulfurization or hydro-treating units constrained total refining operations. I have yet to find citations explaining these claims in detail, although I have read such statements made under oath in legal proceedings.

The price impact of removing light sweet crude from the market price depends on the price elasticity of demand for crude oil. Professor Nordhaus recently published an estimate of the price elasticity of demand for crude of -0.04.[6] This elasticity is measured in regard to refiner demand for all crude oil. Because light sweet crude oil has special properties, the price elasticity of demand for light sweet crude may be lower, say, -0.02. The latter elasticity implies that a one-percent reduction in the light sweet crude supply would require a price increase of between 25 and 40 percent to balance the market.

As noted above, we calculated that DOE's SPR action has taken between 0.1 and 0.5 percent of the sweet crude supply from the market. Using the elasticities given earlier, one can estimate that DOE's actions added between five and 20 percent to the price of oil. On average, it appears that DOE's SPR program probably added $10 per barrel.

Option hedging may have magnified the price rise.

The November 29, 2007 *New York Times* carried a detailed report on airline fuel hedging practices. In one of the few good articles on petroleum to appear in the *Times* in years, Jeff Bailey disclosed a secret that a few of us have known for a long while: Southwest Airlines has fuel management practices that are very different from all other airlines.[7] Through hedging, Southwest has held its fuel cost to a $51-per-barrel basis in 2007, 2008, and 2009, while other airlines are dealing with prices between 50 and 100 percent higher. Southwest's hedges enabled it to book a profit on fuel of $429 million for the first half of 2007. The profit might jump to $1 billion in the second half of the year.

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[6] William Nordhaus, "Who's Afraid of a Big Bad Oil Shock," *Brookings Papers on Economic Activity* 2, 2007 (forthcoming).

[7] Jeff Bailey, "An Airline Shrugs at Oil Prices," *The New York Times*, November 29, 2007.

Southwest achieved its position through the purchase of options: instruments that allow it to buy crude at the strike price ($51-per-barrel crude equivalent) if market prices are higher. Should prices fall below $51, though, Southwest is not obligated to act.

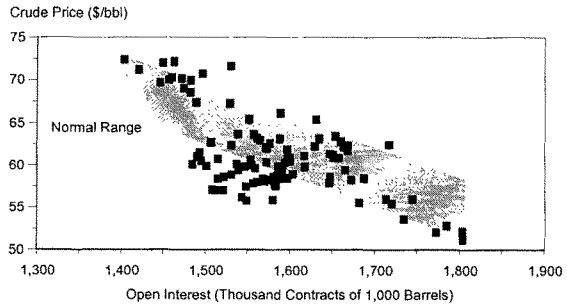
Southwest is not the only firm to use options. Many large consumers and some speculators have purchased call options with strike prices between $60 and $100 per barrel, while several producers have hedged production by acquiring puts. Bailey reported on the position of a number of airlines that had purchased calls at strike prices ranging from $62 per barrel (Alaska Airlines) to $99 (Delta).

The institutions that write call options hedge their exposure to Southwest and others following the same strategy: they purchase futures as prices rise. Thus as prices went from $70 per barrel on August 18 to $95 in early November, the financial institutions that had written these calls bought additional futures. Their buying helped to raise prices.

Bankers refer to this process as "delta" hedging. The procedures and the effects are well known. Indeed, delta hedging was widely credited for a large fraction of the decline in copper prices that occurred in 1996 when Sumitomo's effort to manipulate copper prices failed. Last year, delta hedging of puts written to oil producers seemed to accelerate the price decline. The action clearly exaggerated the decrease. I am relatively certain WTI prices would never have dropped below $65 per barrel early in 2007 (they actually went to $51) had they not been pushed down by delta hedging.

The decrease can be seen from Figure 12. This graph shows open interest in crude oil futures on the horizontal axis and price on the vertical axis.[8] Under the delta hedging hypothesis, one would expect to observe falling prices associated with rising open interest because the financial firms that had written put options would need to sell more futures contracts. Precisely such a relationship was observed. As can be seen from Figure 12, during the fall of 2006, there was a relatively close correlation between open interest and prices. In other words, delta hedging pushed prices down.

Figure 12
Light Sweet Crude Prices vs. Open Interest in Crude Futures, August 2006 to January 2007



Source NYMEX, PKVerleger LLC

[8] In this graph, the open interest represents the combined total of NYMEX and ICE contracts.

The shaded area in Figure 12 represents a normal range. This is a calculated from a regression of prices on open interest. It shows a two-standard-deviation range of the predicted price given open interest for the fall period.

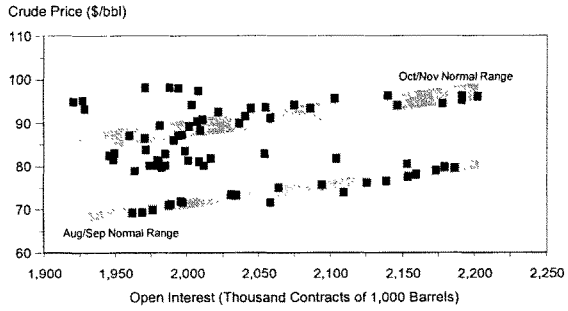
The link to delta hedging in the fall of 2006 was confirmed in discussions with traders. From time to time in markets, one reads or hears that large price moves on a single day were triggered by computer purchases or sales made by financial firms seeking to cover options written by the firms to consumers or producers.

This fall we have observed precisely the opposite effect. Figure 13 shows a scatter diagram of open interest and prices for the August to November 2007 period. Two normal ranges are shown. The first, at the bottom of the graph, is for the August/September period when call options were being hedged for November. The second range at the top shows the normal range calculated for the hedging of December options during the October/November period. Again, we note the shaded area. In 2007 the curves are upward sloping, suggesting it was calls, not puts being hedged.

These data indicate that the price increases tied to DOE's purchases of sweet crude oil were magnified by option hedging.

The market chaos caused by DOE's filling of the SPR can only be mitigated if sour crude is added to the reserve. Regretfully, DOE will do the opposite in the first half of 2008.

Figure 13
Light Sweet Crude Prices vs. Open Interest in Crude Futures, August 2007 to November 2007



Source NYMEX, PKVerleger LLC

I understand from Committee Staff that DOE will add 39,200 barrels per day of light sweet crude to the SPR over six months beginning in January 2008 under a contract announced in November. This rate doubles the rate of the oil being recovered over the last four months of 2007. I suppose I should welcome the announcement. However, I do not.

Let me put the news in perspective. For the first half of 2008, DOE will take between 0.2 and 0.8 percent of the light sweet crude oil supply available to U.S. refiners off of the

market. Applying the Nordhaus price elasticities, this action will boost crude prices between two and five percent. If the price elasticity of demand for light sweet crude is half of the Nordhaus elasticity, the price increase will be between five and ten percent.

This price rise will be magnified by delta hedging of options. Indeed, one can expect prices to move well above $100 per barrel if the relationships suggested here hold. Extrapolation of this fall's evidence could take prices as high as an unbelievable $120 if adult supervision is not brought to bear on DOE. The situation could be made even worse by the arrival of the gasoline season. As noted above and in more detail elsewhere, new environmental regulations place an extra premium on sweet crude in the spring and summer. It will be a disaster for motorists. I suspect it will also be a disaster for the U.S. economy.

I hope events prove me incorrect. I hope my economic analysis is faulty. However, DOE's current action is needlessly risking the health of the U.S. economy. As an alternative, DOE could fill the reserve with sour crude oil, that is, crude having sulfur content above one percent. In theory, DOE could sell sweet crude while acquiring sour crude. Given relative prices, DOE could acquire 12 barrels of sour crude for every 10 barrels of sweet crude sold. Such a policy would accelerate the filling of the reserve and provide even greater protection to the U.S. economy in the event of a true catastrophe.

Properly managed, such a policy would not affect product availability during a crisis. Instead, in the event of troubles, certain environmental regulations could be relaxed to assure Americans of an adequate supply of product. For example, it might be necessary to allow diesel fuel sulfur standards to rise to 200 parts per million.

While some will criticize the necessity of modifying sulfur standards, I note that such changes may be necessary if hurricanes shut down several Gulf Coast refineries for a prolonged period, *even if the SPR has sweet crude*. It is well understood—but never stated—that fuel specifications have to be relaxed after a severe hurricane.

Today, I would argue that the American economy and American consumers would be much better off if DOE changed the mix of crudes being added to the strategic reserve. If I am right, it could make the difference between seeing $60-per-barrel prices next summer and $120-per-barrel prices.

I thank the Committee for its attention.

Appendix A

CFTC Data on Commitments of Traders: Statistics on Commitments of Index Funds[9]

On January 8, 2007, the CFTC issued new information on commitments of "Index Funds" in agricultural futures. These data provide a unique view into the size of the two largest passive long commodity funds, the Goldman Sachs Commodity Index (GSCI) and the Dow Jones-AIG Commodity Index (DJ-AIG). Based on a quick review of the data and the application of some simple algebra, we draw the following conclusions:

> The DJ-AIG index has roughly $40 billion invested in it.
>
> The GSCI has between $60 and $66 billion invested in it.
>
> Total investment in commodities is approximately $100 billion, which roughly matches published figures from other sources.

The CFTC does not present information on index trading in metals or oils. However, one can back out rough estimates. As of Wednesday, January 3, 2007, it appeared that commodity investors accounted for more than 20 percent of the long positions in WTI and Brent, more than 25 percent of the long position in the RBOB gasoline contract, and more than 35 percent of the long position in distillate heating oil.

Background

The CFTC explained the new data as follows:

> ***Supplemental Report*** – Based upon the information contained in the report of futures-and-options combined in the short format, the Supplemental Report shows an additional category of "Index Traders" in selected agricultural markets. These traders are drawn from the Noncommercial and Commercial categories.
>
> Coming from the Noncommercial category are positions of managed funds, pension funds, and other investors that are generally seeking exposure to a broad index of commodity prices as an asset class in an unleveraged and passively managed manner. Coming from the Commercial category are positions for entities whose trading predominantly reflects hedging of over-the-counter transactions involving commodity indices—for example, a swap dealer holding long futures positions to hedge a short commodity index exposure opposite institutional traders, such as pension funds.

[9] Originally published as *Notes at the Margin Supplement to January 8 Issue*, January 9, 2007.

All of these traders—whether coming from the Noncommercial or Commercial categories—are generally replicating a commodity index by establishing long futures positions in the component markets and then rolling those positions forward from future to future using a fixed methodology.

Some traders assigned to the Index Traders category are engaged in other futures activity that could not be disaggregated. As a result, the Index Traders category, which is typically made up of traders with long-only futures positions replicating and index, will include some long and short positions where traders have multi-dimensional trading activities, the preponderance of which is index trading. Likewise the Index Traders category will not include some traders who are engaged in index trading, but for whom it does not represent a substantial part of their overall trading activity.

We summarize the basic statistics from the new CFTC reports in Table 1. There we show the contract, the net position of index funds in the contract, and the percentage of open interest in the contract accounted for by index funds.

Table 1. Net Position of Index Funds in 12 Agricultural Contracts

Contract	Total Open Interest	Net Position of Index Traders	Index Traders as a Percentage of Total Open Interest
Wheat: Chicago Board of Trade	513,744	201,104	39.1
Wheat: Kansas City Board of Trade	127,957	29,963	23.4
Corn: Chicago Board of Trade	1,962,900	421,579	21.5
Soybeans: Chicago Board of Trade	497,953	129,727	26.1
Soybean Oil: Chicago Board of Trade	287,650	67,869	23.6
Cotton No. 2: New York Board of Trade	244,076	82,389	33.8
Lean Hogs: Chicago Mercantile Exchange	180,870	83,346	46.1
Live Cattle: Chicago Mercantile Exchange	267,023	94,995	35.6
Feeder Cattle: Chicago Mercantile Exchange	30,462	7,373	24.2
Cocoa: New York Board of Trade	162,595	13,666	8.4
Sugar No. 11: New York Board of Trade	786,586	156,614	19.9
Coffee C: New York Board of Trade	177,345	36,982	20.9

Source: CFTC Supplemental Report on Commitments of Traders.

Calculating the Size of Individual Funds

The data published by the CFTC can be used to gauge the size of the two principal funds, the DJ-AIG and the GSCI, because neither fund contains all 12 agricultural commodities. For example, the GSCI contract includes Kansas City wheat and feeder cattle but the DJ-AIG does not. On the other hand, the DJ-AIG includes soybean oil while the GSCI does not. This means that one can gauge the size of each fund ***if one assumes there are no other index funds in the market.*** (This assumption is extreme because there is at least one other fund, the Deutsche Bank Index. However, it apparently is quite similar to the DJ-AIG.)

If one makes this assumption, one can calculate the size of the index by determining the value of the index position in the futures contract unique to the index (for example, soy-

bean oil for the DJ-AIG) and then dividing this value by the percentage weight in the index assigned to that commodity. For the DJ-AIG index, the calculation works as follows:

> Index funds held 67,874 soybean oil contracts on January 3.
>
> The value of the contracts on January 3 was roughly $1.2 billion.
>
> The DJ-AIG market share for the index was 3.1 percent.
>
> Thus the total size of the DJ-AIG index was approximately $39 billion (1.2 divided by .031).

A similar calculation for the GSCI yielded estimates of $59 and $66 billion. These market values were then tested against the other commodities. Specifically, we multiplied the estimated value of the GSCI index by the index weight for CBOT wheat and the estimated value of the DJ-AIG index by its weight for CBOT wheat. The sum of the two values 92 percent of the estimated index investment in wheat. Percentages for the other commodities were generally between 95 and 105 percent, although weights differed considerably. This test provides initial confirmation that the sizes are roughly correct.

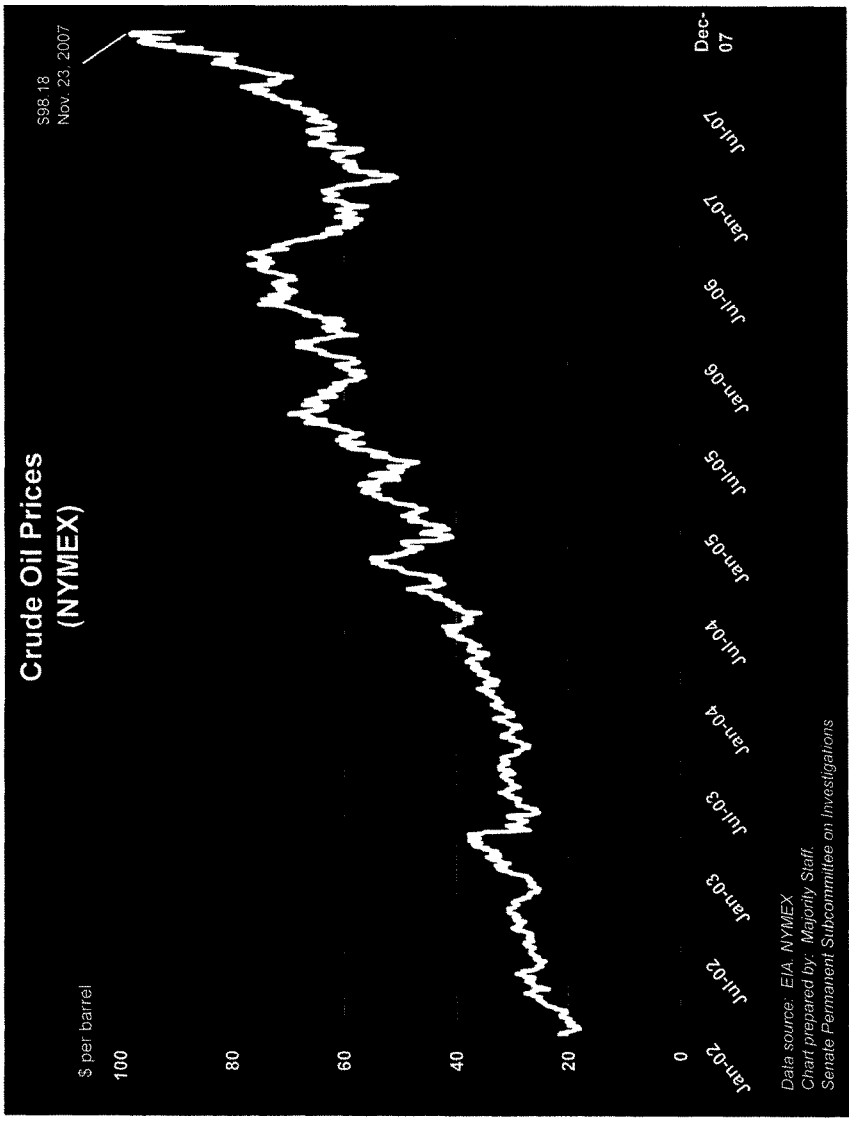
Table 2. First Approximation of the Share of DJ-AIG and GSCI in Principal Energy Funds

Commodity	Dollar Value of Contracts (Millions)	DJ-AIG Allocation (%)	GSCI Allocation (%)	Percent of Market Accounted for by Index Investors
Natural Gas	$128,769	7.1	7.4	5 6
WTI	$99,570	10.6	31.2	23.1
NY Harbor RBOB	$9,747	3.2	2.4	27.6
NY Harbor Heating Oil	$14,909	3.1	8.0	40.5
Brent	$33,343		15.0	27.0
Gasoil	$16,526		4.4	16 0

Source: Weights taken from Alvin Ying et al., *Commodity Index Monitor*, December 2006; PKVerleger LLC

Calculating the Market Share in Petroleum

Our estimate of fund size was used to calculate the aggregate index positions in energy markets. The calculations are shown in Table 2. Column 1 shows the estimated value of the individual market (price multiplied by open interest on January 3, 2007). Columns 2 and 3 show the share of total investment in the fund to the individual contract. Column 4 shows our estimate of the total fund investment in the commodity as a percentage of the commodity's value.



Permanent Subcommittee on Investigations
EXHIBIT #1

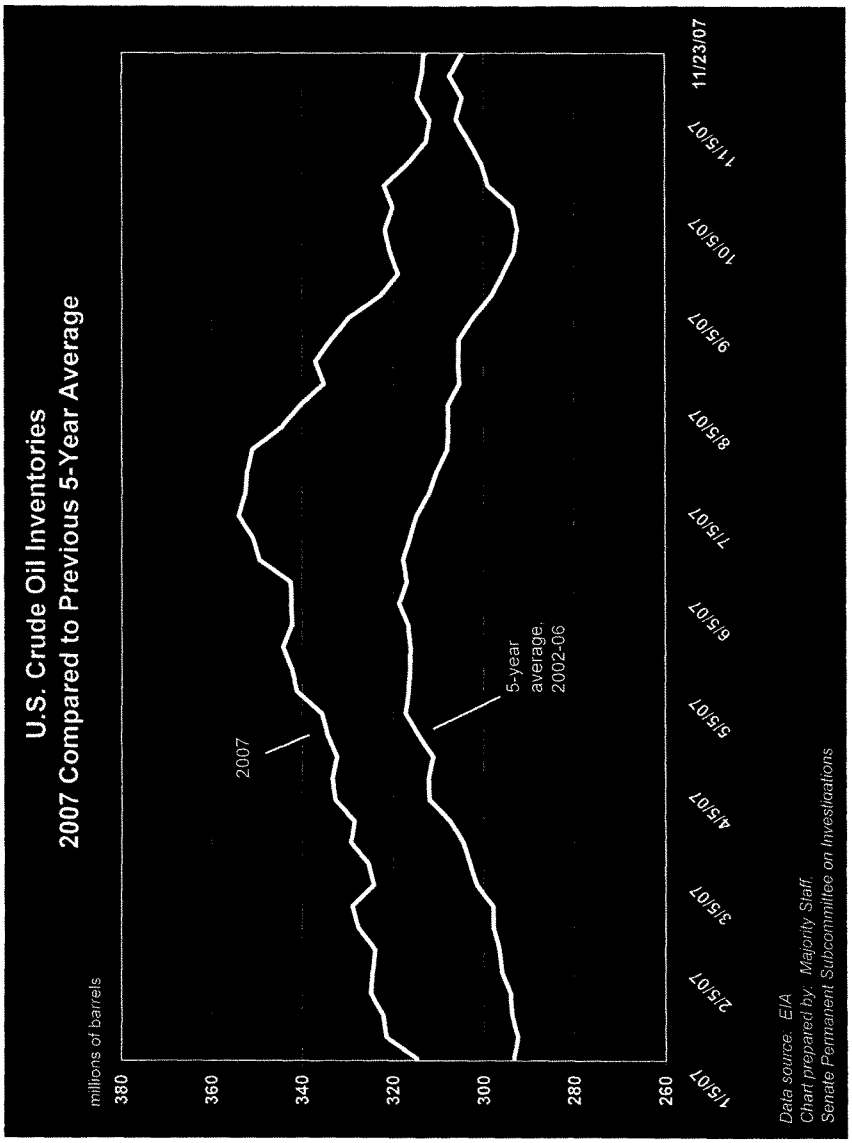


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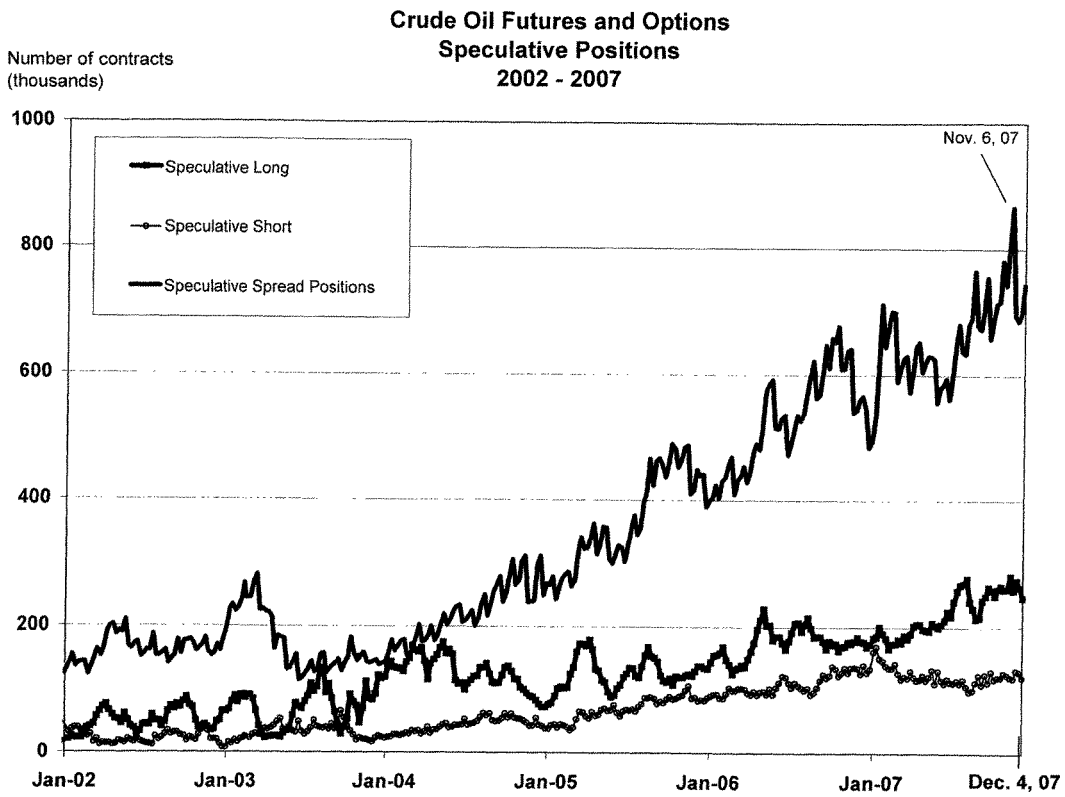
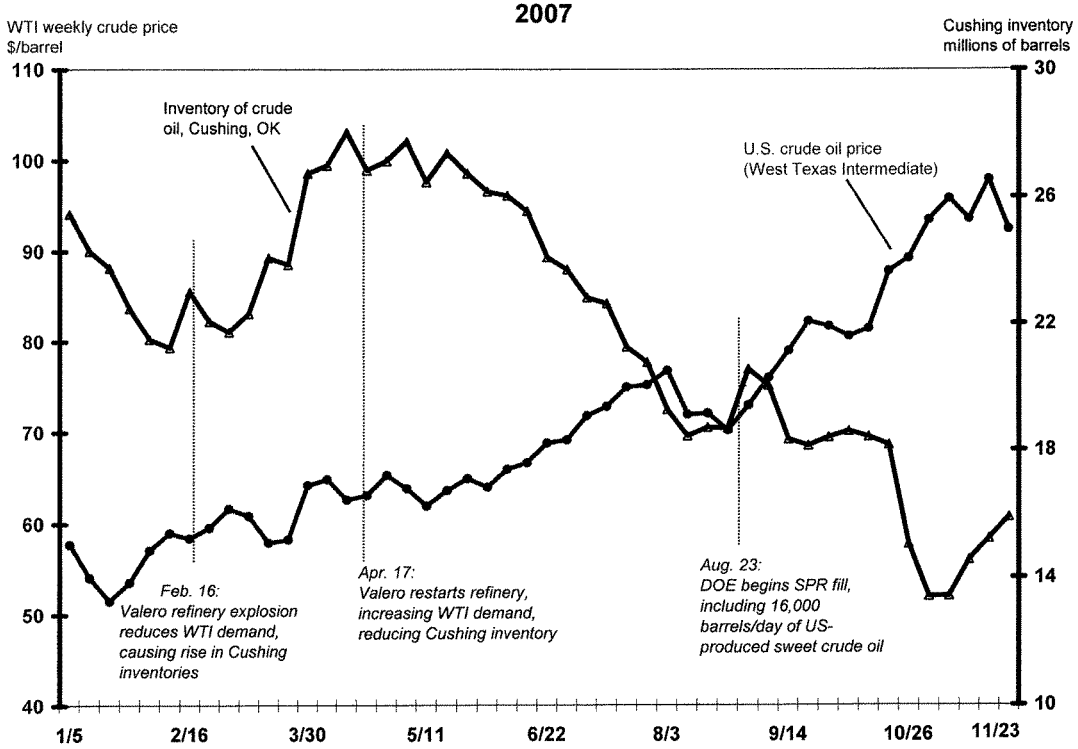
EXHIBIT #3



Data source: CFTC
Chart prepared by: Majority staff,
Senate Permanent Subcommittee on Investigations

Permanent Subcommittee on Investigations
EXHIBIT #4

U.S. Crude Oil: Prices and Inventories at Cushing, OK
2007



Data source: EIA
Chart prepared by: Majority Staff, Senate Permanent Subcommittee on Investigations

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This Week In Petroleum

Released on November 7, 2007
(Next Release on November 15, 2007)

Why Are Oil Prices So High?
One of the most discussed topics in the media today, besides the 2008 Presidential races, is the high price of oil. Crude oil prices have increased dramatically this year, with West Texas Intermediate (WTI) prices climbing from an average of nearly $55 per barrel in January to over $95 per barrel at the beginning of this month. EIA believes that supply and demand fundamentals, including strong world economic growth driving growth in oil use, moderate non-Organization of the Petroleum Exporting Countries (OPEC) supply growth, OPEC members' production decisions, low OPEC spare production capacity, tightness in global commercial inventories, worldwide refining bottlenecks, and ongoing geopolitical risks and concerns about supply availability, have been the main driver of oil price movements over the past year.

With the rapid rise in prices, oil markets have been drawing increased interest and participation from investors and financial entities without direct commercial involvement in physical oil markets. The role of these non-commercial futures market participants in recent price developments is difficult to assess, particularly over short time intervals. However, general principles favor a focus on fundamentals, rather than consideration of alternative price drivers, when the explanatory power of fundamentals is high.

Strong world economic growth has resulted in strong world oil demand despite higher price levels. China, the United States, and the Middle East countries are the main drivers of consumption growth, and China and the United States alone are projected to account for half of world oil consumption growth in 2007 and 2008. The Chinese economy has shown few signs of slowing down, and the economies of oil exporting countries in the Middle East and Russia have also benefited from higher oil revenues, boosting oil consumption. In addition, the decline in the value of the dollar against other currencies supports continued oil consumption growth in foreign countries because oil is traded globally in dollars, and a declining dollar has made the increase in oil prices less severe in foreign currencies.

A key factor contributing to high prices has been the inability of non-OPEC production growth to keep pace with global oil consumption growth. Non-OPEC production increased by 0.2 million barrels per day (bbl/d) in 2006, and is projected to rise by 0.6 and 0.9 million bbl/d in 2007 and 2008, respectively, significantly less than the increase in global oil consumption. Non-OPEC production growth remains concentrated in a few areas, and has experienced some downward revisions in recent years due to project delays and growing decline rates in some non-OPEC nations, especially Mexico, the United Kingdom and Norway.

When non-OPEC supply growth is less than growth in global consumption, the gap needs to be filled by OPEC members' production increases or draws from global inventories will result. OPEC's decisions to cut production in November 2006 and February 2007 played a critical role in reversing the oil price slide at the end of last year. OPEC's announcement that it would increase production this month has not yet dampened upward price pressure, and it is unlikely that these higher volumes will be

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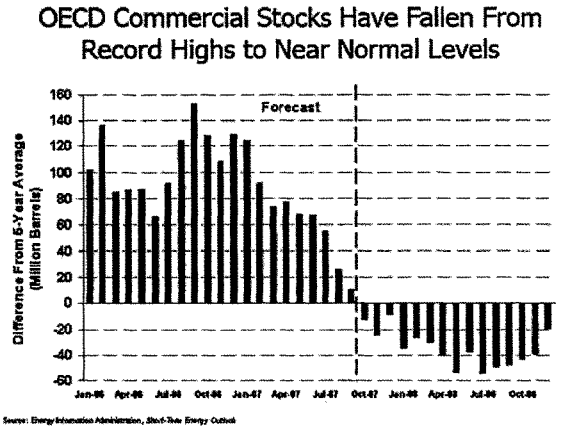
EXHIBIT #5

enough to halt the downward trend in commercial inventories over the next several months. In addition, fairly low OPEC surplus production capacity (concentrated in Saudi Arabia) leaves the market with little flexibility to respond to surprises in supply and demand. EIA's outlook for continued rising oil consumption and moderate non-OPEC production growth suggests that world surplus production capacity will remain fairly low at around 2-to-3 million bbl/d.

OPEC's production cuts, in combination with continued strong demand growth exceeding the growth in non-OPEC production have led to declining commercial oil inventories (see chart below). While OECD commercial inventories were 150 million barrels above their 5-year average at the end of September 2006, EIA projects that OECD commercial stocks will be about 10 million barrels below the 5-year average by the end of this year. EIA projects that inventories will continue to decline relative to the average in the first quarter of 2008, and will move toward the lower end of the 5-year range through 2008.



The margin for error has also declined in the downstream sector, as excess capacity in the refining industry has been shrinking with the growth in demand for refined products. Low excess refining capacity leaves less of a buffer for periods when the supply and demand balance becomes unusually tight. Furthermore, low excess refining capacity leaves little flexibility to accommodate unplanned refinery outages.

Geopolitical instability in many OPEC, as well as non-OPEC countries, has put additional upward pressure on inventory demand and crude oil prices. A lack of political stability continues to threaten production in several OPEC nations, including Iraq, Nigeria, Venezuela and Iran. The threat of a possible Turkish incursion against Kurdish rebels in Iraq has added to supply worries.

All of these factors, have combined to cause oil prices to rise significantly in 2007. How high prices ultimately reach will depend not only on these factors, but also the market's perception of these fundamental factors in the future.

Residential Heating Fuel Prices Increase Sharply
Residential heating oil prices attained greater heights during the period ending November 5, 2007. The average residential heating oil price jumped 15.7 cents last week to reach 311.0 cents per gallon, an increase of 72.8 cents from this time last year. Wholesale heating oil prices increased by 13.9 cents, reaching 263.5 cents per gallon, an increase of 87.6 cents compared to the same period last year.

The average residential propane price increased 8.3 cents to hit 233.1 cents per gallon. This was an increase of 39.7 cents compared to the 193.4 cents per gallon average for this same time last year. Wholesale propane prices rose by 6.6 cents per gallon, from 157.5 to 164.1 cents per gallon. This was an increase of 62.1 cents from the October 30, 2006 price of 102.0 cents per gallon.

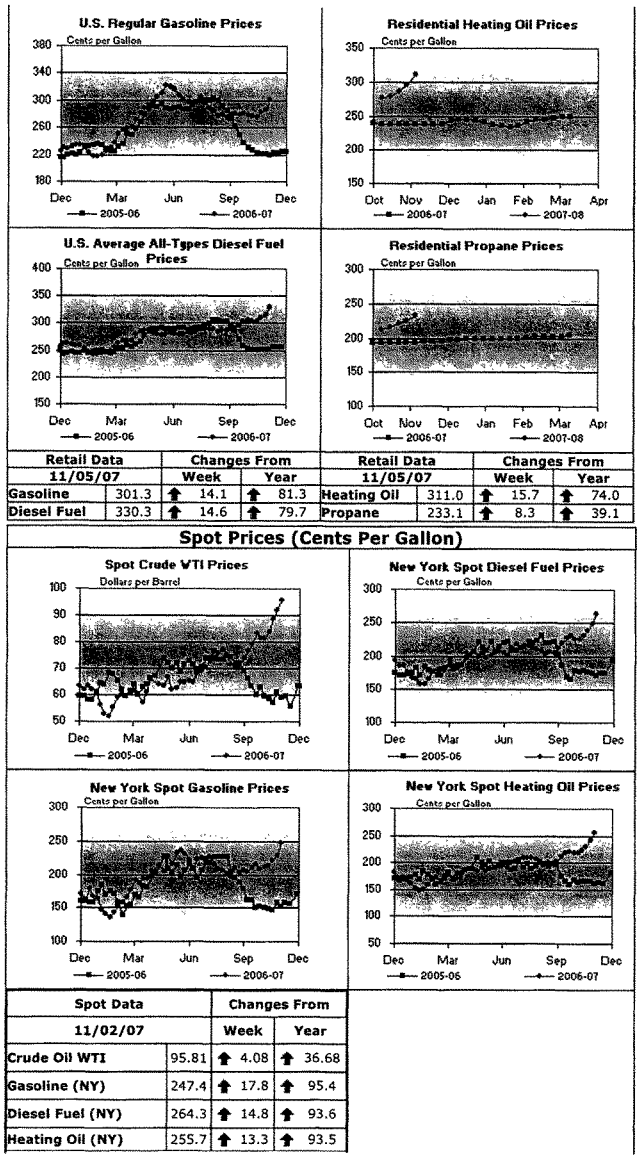
Diesel Price Sets National and Regional Record Highs
The U.S. average retail price for regular gasoline soared to 301.3 cents per gallon as of November 5, 2007, 14.1 cents over last week and 81.3 cents higher than last year. Gains were recorded in all regions with the largest increase in Midwest which rose 17.3 cents to 303.7 cents per gallon, 85.0 cents above a year ago. The East Coast price climbed 14.1 cents to 297.4 cents per gallon while the Gulf Coast rose 15.8 cents to 289.3 cents per gallon, still the lowest regional price. The Rocky Mountain region increased 9.9 cents to settle at 297.2 cents per gallon. The highest price in the country was on the West Coast, 316.5 cents per gallon, a jump of 7.4 cents this week. The average price for regular grade in California was 323.1 cents per gallon, up 7.2 cents from last week and 83.5 cents per gallon over the previous year.

Ascending to both national and regional record highs, retail diesel prices skyrocketed 14.6 cents last week to reach 330.3 cents per gallon, surpassing the previous record high price by 14.6 cents. All regional prices peaked to unprecedented highs as the East Coast climbed 14.2 cents to hit 329.0 cents per gallon. The Midwest price moved higher to 327.8 cents per gallon, increasing by 15.6 cents. The Gulf Coast gained 15.7 cents per gallon to 321.9 cents per gallon. The Rocky Mountain price increased to 341.1 cents per gallon, a gain of 13.0 cents. The West Coast tallied the highest regional price, hitting 350.8 cents per gallon after jumping 11.4 cents. California prices were up 11.8 cents to 352.4 cents per gallon, another record price for the State.

Propane Inventories Post Small October Gain
Much warmer-than-normal temperatures during the month contributed to a small 2.4-million barrel stock gain recorded for total propane inventories during October, a level that nearly matched the most recent 5-year average of 2.6 million barrels. However, the final week of October saw inventories fall by 0.4 million barrels, positioning the Nation's primary supply of propane at an estimated 61.5 million barrels as of November 2, 2007. East Coast and Midwest inventories posted declines of 0.2 million barrels and 0.1 million barrels, respectively, while inventories in the Gulf Coast remained relatively unchanged during this same period. The combined Rocky Mountain/West Coast region saw inventories decline by 0.1 million barrels last week. Propylene non-fuel use inventories rose by 0.1 million barrels last week to account for a 3.2 percent share of total propane/propylene inventories, compared with 3.0 percent from the prior week.

Text from the previous editions of "This Week In Petroleum" is now accessible through a link at the top right-hand corner of this page.

Retail Prices (Cents Per Gallon)	



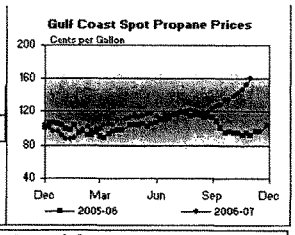
Retail Data 11/05/07		Changes From Week		Changes From Year
Gasoline	301.3	↑ 14.1	↑ 81.3	
Diesel Fuel	330.3	↑ 14.6	↑ 79.7	

Retail Data 11/05/07		Changes From Week		Changes From Year
Heating Oil	311.0	↑ 15.7	↑ 74.0	
Propane	233.1	↑ 8.3	↑ 39.1	

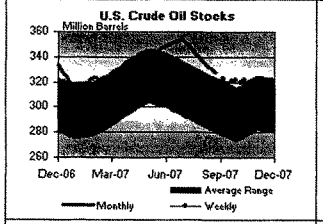
Spot Data 11/02/07		Changes From Week		Changes From Year
Crude Oil WTI	95.81	↑ 4.08	↑ 36.68	
Gasoline (NY)	247.4	↑ 17.8	↑ 95.4	
Diesel Fuel (NY)	264.3	↑ 14.8	↑ 93.6	
Heating Oil (NY)	255.7	↑ 13.3	↑ 93.5	

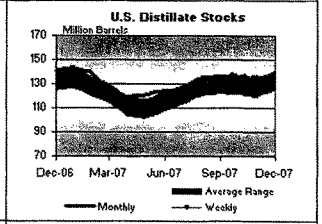
Propane Gulf Coast	159.5	↑ 7.4	↑ 68.5

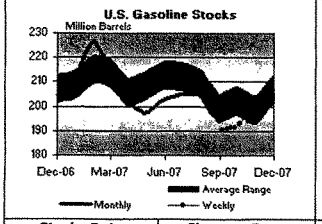
Note: Crude Oil WTI Price in Dollars per Barrel.

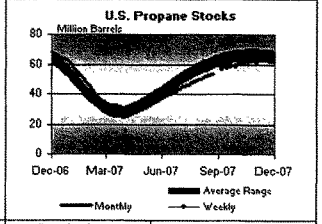


Stocks (Million Barrels)









Stocks Data		Changes From		Stocks Data		Changes From	
11/02/07		Week	Year	11/02/07		Week	Year
Crude Oil	311.9	↓ -0.8	↓ -22.8	Distillate	135.4	↑ 0.1	↓ -3.2
Gasoline	194.3	↓ -0.8	↓ -9.7	Propane	61.489	↓ -0.442	↓ -9.975

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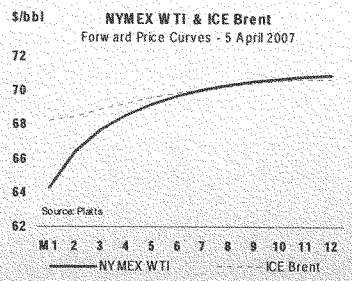
Distorting a Benchmark

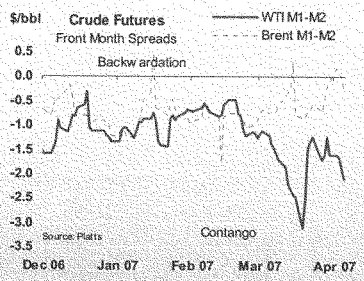
The persistence of WTI's unusual weakness to other domestic and international crudes has raised questions about its viability as a regional benchmark. While globally, oil prices have risen, WTI, a landlocked crude, weakened in relative terms due to local factors. Prolonged outages at Valero's McKee refinery have forced the company to re-route its intake of WTI towards Cushing, where crude stocks were already high due to a steady influx of Canadian barrels. This has led to some unusual price relationships – seaborne US Gulf crudes such as LLS or, even more unusually, sour marker Mars, have been trading at premiums to WTI.

The contrast with Dated Brent, recently even in backwardation for the first two months due to tight European crude stocks, is equally dramatic. Traditionally, WTI has traded at a premium of around $1.50/bbl to Dated Brent which tends to encourage European and African crudes across the Atlantic. But the recent weakness of WTI has pushed the spot spread to a discount of $5/bbl and more, and forward spreads remain at a discount at least six months forward.

This anomaly has not prevented crude oil trading: traders are either using larger discounts to WTI, or have reportedly switched their calculations to more (currently) representative US crudes such as LLS. So why worry?

Pricing benchmarks have emerged over a period of time because they possess certain characteristics – notably location, quality, stability and liquidity. To make the next step and become an accepted futures benchmark is even harder – only two crudes have achieved that status so far – Brent and WTI. Futures market status means that traders can price a multitude of crudes at either a premium or a discount to the benchmark, and both consumers and producers can hedge their risks. But while the risk from shifts in the price of the futures contract can be hedged, the price premium or discount (the basis risk) to that crude often cannot.





Large swings in the benchmark increase hedging risk and when, as has been the case recently, the basis risk has been larger than the outright shifts in crude oil prices, the viability of the benchmark is called into question. If this is a one-off shift, then the market will quickly shrug it off. But if volatility persists, then volumes may shift to a more stable alternative. More likely, as we have seen in other benchmarks such as Brent and Oman/Dubai, changes to the contract are an option. The market may also see opportunities in the price differential, leading to the construction of more storage capacity or pipelines offering alternative routes out of the Cushing region.

Ultimately, many areas of the industry have a vested interest in maintaining a reliable benchmark and it is unlikely that one bout of volatility will change the status of WTI. But repetitions of such events could spark a search for alternatives.

Permanent Subcommittee on Investigations
EXHIBIT #6

Permanent Subcommittee on Investigations
EXHIBIT #7

Trends in Hedge Fund Industry Assets and Oil Prices

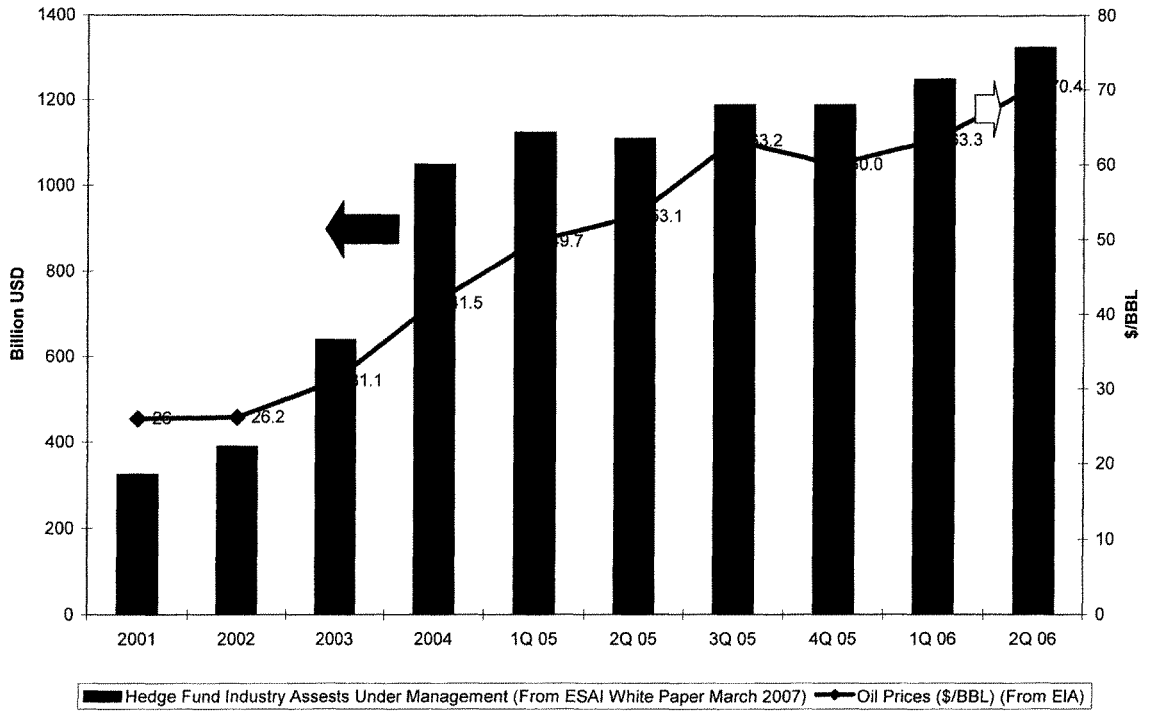
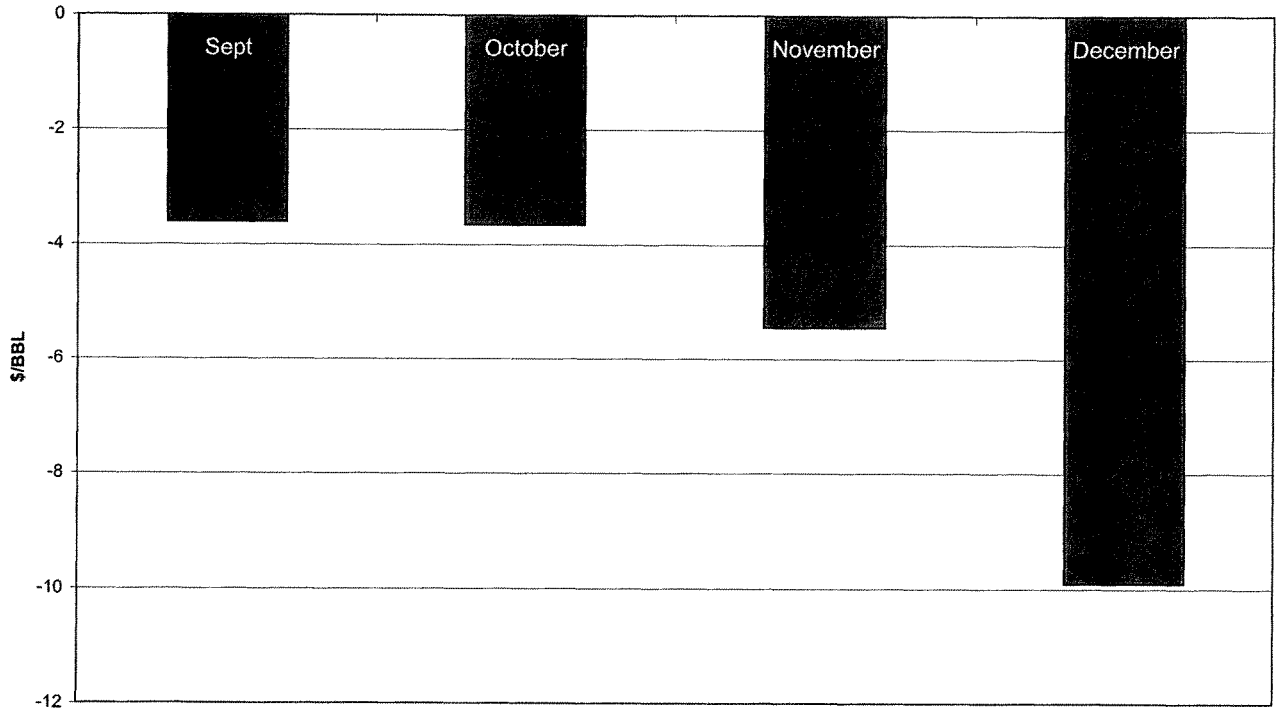


Chart prepared by:
Office of Sen. Dorgan

Decrease in the Price of Saudi Light Relative to WTI Since May 2007



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Permanent Subcommittee on Investigations
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109th Congress
2nd Session

SENATE

S. PRT.
109–65

THE ROLE OF MARKET SPECULATION IN RISING OIL AND GAS PRICES: A NEED TO PUT THE COP BACK ON THE BEAT

STAFF REPORT

PREPARED BY THE

PERMANENT SUBCOMMITTEE ON INVESTIGATIONS

OF THE

COMMITTEE ON
HOMELAND SECURITY AND
GOVERNMENTAL AFFAIRS
UNITED STATES SENATE

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THE ROLE OF MARKET SPECULATION IN RISING OIL AND GAS PRICES: A NEED TO PUT THE COP BACK ON THE BEAT

I. EXECUTIVE SUMMARY

For the past 5 years, the U.S. Senate Permanent Subcommittee on Investigations has conducted a number of investigations into the pricing of energy commodities, including gasoline, crude oil, and natural gas.[1] These investigations reflect a continuing concern over the sustained increases in the price and price volatility of these essential commodities, and, in light of these increases, the adequacy of governmental oversight of the markets that set these prices.

Over the past 6 years, crude oil, gasoline, and natural gas prices have risen significantly. Crude oil has risen from a range of $25–$30 per barrel in 2000, to a range of $60–$75 per barrel in 2006. High crude oil prices are a major reason for the record or near-record highs of the prices of a variety of petroleum products, including gasoline, heating oil, diesel fuel, and jet fuel. The average price for a gallon of regular unleaded gasoline has jumped from $1.46 per gallon in 2000 to $2.36 per gallon over the past 12 months, with peaks at $3.14 per gallon in September 2005, and $2.93 per gallon in May 2006. Rising crude oil prices have helped push up natural gas prices as well: the price of natural gas has risen from $2–$3 per million BTU (British Thermal Unit) in 2000 to a typical range of $6–$8 per million BTU during the past year.

The traditional forces of supply and demand cannot fully account for these increases. While global demand for oil has been increasing—led by the rapid industrialization of China, growth in India, and a continued increase in appetite for refined petroleum products, particularly gasoline, in the United States—global oil supplies have increased by an even greater amount. As a result, global inventories have increased as well. Today, U.S. oil inventories are at an 8-year high, and OECD oil inventories are at a 20-year high. Accordingly, factors other than basic supply and demand must be examined. For example, political instability and hostility to the United States in key producer countries, such as Nigeria, Ven-

[1] *See, e.g.,* Minority Staff, U.S. Senate Permanent Subcommittee on Investigations, *U.S. Strategic Petroleum Reserve: Recent Policy Has Increased Costs to Consumers But Not Overall U.S. Energy Security,* S. Prt. 108–18 (March 5, 2003); Majority Staff, U.S. Senate Permanent Subcommittee on Investigations, *Gas Prices: How Are They Really Set?,* reprinted in *Gas Prices: How Are They Really Set,* Hearings before the U.S. Senate Permanent Subcommittee on Investigations (S. Hrg. 107–509) (April 30 and May 2, 2002), at p. 322; U.S. General Accounting Office, *Effects of Mergers and Market Concentration in the U.S. Petroleum Industry,* Report to the Ranking Minority Member, U.S. Senate Permanent Subcommittee on Investigations, GAO–04–96 (May 2004); *Volatility in the Natural Gas Market: The Impact of High Natural Gas Prices on American Consumers,* Hearing before the U.S. Senate Permanent Subcommittee on Investigations (S. Hrg. 109–398) (February 13, 2006).

ezuela, Iraq, and Iran, threaten the security and reliability of these supplies. Furthermore, in each of the past 2 years hurricanes have disrupted U.S. oil and gas production in the Gulf of Mexico. As Saudi Arabia has increased its rate of production to meet increasing demand, its ability to pump additional oil in the event of a shortfall has declined, thereby providing less of a cushion in the event of a supply disruption. It is often asserted that these fears over the adequacy of supply have built a "risk premium" into crude oil prices.[2]

In addition, over the past few years, large financial institutions, hedge funds, pension funds, and other investment funds have been pouring billions of dollars into the energy commodities markets—perhaps as much as $60 billion in the regulated U.S. oil futures market alone—to try to take advantage of price changes or to hedge against them. Because much of this additional investment has come from financial institutions and investment funds that do not use the commodity as part of their business, it is defined as "speculation" by the Commodity Futures Trading Commission (CFTC). According to the CFTC, a speculator "does not produce or use the commodity, but risks his or her own capital trading futures in that commodity in hopes of making a profit on price changes." Reports indicate that, in the past couple of years, some speculators have made tens and perhaps hundreds of millions of dollars in profits trading in energy commodities. This speculative trading has occurred both on the regulated New York Mercantile Exchange (NYMEX) and on the over-the-counter (OTC) markets.

The large purchases of crude oil futures contracts by speculators have, in effect, created an additional demand for oil, driving up the price of oil to be delivered in the future in the same manner that additional demand for the immediate delivery of a physical barrel of oil drives up the price on the spot market. As far as the market is concerned, the demand for a barrel of oil that results from the purchase of a futures contract by a speculator is just as real as the demand for a barrel that results from the purchase of a futures contract by a refiner or other user of petroleum.

Although it is difficult to quantify the effect of speculation on prices, there is substantial evidence that the large amount of speculation in the current market has significantly increased prices. Several analysts have estimated that speculative purchases of oil futures have added as much as $20–$25 per barrel to the current price of crude oil, thereby pushing up the price of oil from $50 to approximately $70 per barrel. Additionally, by purchasing large numbers of futures contracts, and thereby pushing up futures prices to even higher levels than current prices, speculators have provided a financial incentive for oil companies to buy even more oil and place it in storage. A refiner will purchase extra oil today, even if it costs $70 per barrel, if the futures price is even higher.

As a result, over the past 2 years, crude oil inventories have been steadily growing, resulting in U.S. crude oil inventories that are now higher than at any time in the previous 8 years. The last time crude oil inventories were this high, in May 1998—at about 347

[2] *See, e.g.,* Statement of Daniel Yergin, *World Crude Oil Pricing,* Hearing before the U.S. House of Representatives Committee on Energy and Commerce, May 4, 2006.

million barrels—the price of crude oil was about $15 per barrel. By contrast, the price of crude oil is now about $70 per barrel. The large influx of speculative investment into oil futures has led to a situation where we have high crude oil prices despite high levels of oil in inventory.

As former Federal Reserve Chairman Alan Greenspan recently explained in testimony before the Congress, over the past few years "there has been a major upsurge in over-the-counter trading of oil futures and other commodity derivatives."[3] Hedge funds and other institutional investors have accumulated "substantial net long positions in crude oil futures, largely in the over-the-counter market."[4] According to Mr. Greenspan, these futures positions have created an additional demand for oil for future delivery, and "with the demand from the investment community, oil prices have moved up sooner than they would have otherwise." Mr. Greenspan states these price increases have stimulated additional oil production, a large increase in oil inventories, and a partial scale-back of consumption.[5]

In general, speculative trading brings greater liquidity to the futures market, so that companies seeking to hedge their exposure to commodity prices can find counterparties willing to take on those price risks. Speculative purchases of futures contracts can also, in effect, finance the production and storage of the underlying commodity to meet future demand. On the other hand, large speculative buying or selling of futures contracts can distort the market signals regarding supply and demand in the physical market or lead to excessive price volatility, either of which can cause a cascade of consequences detrimental to the overall economy.

A key responsibility of the CFTC is to ensure that prices on the futures market reflect the laws of supply and demand rather than manipulative practices[6] or excessive speculation.[7] The Commodity Exchange Act (CEA) states, "Excessive speculation in any commodity under contracts of sale of such commodity for future delivery . . . causing sudden or unreasonable fluctuations or unwarranted changes in the price of such commodity, is an undue and unnecessary burden on interstate commerce in such commodity."[8] The CEA directs the CFTC to establish such trading limits "as the Commission finds are necessary to diminish, eliminate, or prevent such burden."[9]

At the same time that there has been a huge influx of speculative dollars in energy commodities, the CFTC's ability to monitor the nature, extent, and effect of this speculation has been diminishing. Most significantly, there has been an explosion of trading of U.S. energy commodities on exchanges that are not regulated by the CFTC. Available data on the nature and extent of this speculation is limited, so it is not possible for anyone, including the CFTC,

[3] Statement of Alan Greenspan, *Oil Depends on Economic Risks*, Hearing before the Committee on Foreign Relations, U.S. Senate, June 7, 2006.
[4] *Id.*
[5] *Id.*
[6] 7 U.S.C. § 5(b),
[7] 7 U.S.C. § 6a(a).
[8] *Id.*
[9] *Id.*

to make a final determination about the current level of speculation.

In *Irrational Exuberance,* which forecasted the collapse of stock market prices in 2000–2001, Professor Robert Shiller wrote of the importance of understanding the role of speculation in setting market prices. "We need to know confidently whether the increase that brought us here is indeed a *speculative bubble*—an unsustainable increase in prices brought on by investors" buying behavior rather than by genuine, fundamental information about value. In short, we need to know if the value investors have imputed to the market is not really there, so that we can readjust our planning and thinking." [10]

To a certain extent, whether any level of speculation is "excessive" lies within the eye of the beholder. In the absence of data, however, it is impossible to begin the analysis or engage in an informed debate over whether our energy markets are functioning properly or are in the midst of a speculative bubble. Again, Professor Shiller has warned, "It is a serious mistake for public figures to acquiesce in the stock market valuations we have seen recently, to remain silent about the implications of such high valuations, and to leave all commentary to the market analysts. . . . The valuation of the stock market is an important national—indeed international issue." [11] This advice would appear to be as relevant to the energy markets as to the stock market.

Until recently, U.S. energy futures were traded exclusively on regulated exchanges within the United States, like the NYMEX, which are subject to extensive oversight by the CFTC, including ongoing monitoring to detect and prevent price manipulation or fraud. In recent years, however, there has been a tremendous growth in the trading of contracts that look and are structured just like futures contracts, but which are traded on unregulated OTC electronic markets. Because of their similarity to futures contracts they are often called "futures look-alikes." The only practical difference between futures look-alike contracts and futures contracts is that the look-alikes are traded in unregulated markets whereas futures are traded on regulated exchanges. The trading of energy commodities by large firms on OTC electronic exchanges was exempted from CFTC oversight by a provision inserted at the behest of Enron and other large energy traders into the Commodity Futures Modernization Act of 2000 in the waning hours of the 106th Congress.

The impact on market oversight has been substantial. NYMEX traders, for example, are required to keep records of all trades and report large trades to the CFTC. These Large Trader Reports (LTR), together with daily trading data providing price and volume information, are the CFTC's primary tools to gauge the extent of speculation in the markets and to detect, prevent, and prosecute price manipulation. CFTC Chairman Reuben Jeffery recently stated: "The Commission's Large Trader information system is one of the cornerstones of our surveillance program and enables detection

[10] Robert J. Shiller, *Irrational Exuberance* (Princeton University Press, 2000), at p. 5.
[11] *Id.*, at pp. 203–204.

of concentrated and coordinated positions that might be used by one or more traders to attempt manipulation."[12]

In contrast to trades conducted on the NYMEX, traders on unregulated OTC electronic exchanges are not required to keep records or file Large Trader Reports with the CFTC, and these trades are exempt from routine CFTC oversight. In contrast to trades conducted on regulated futures exchanges, there is no limit on the number of contracts a speculator may hold on an unregulated OTC electronic exchange, no monitoring of trading by the exchange itself, and no reporting of the amount of outstanding contracts ("open interest") at the end of each day.

The CFTC's ability to monitor the U.S. energy commodity markets was further eroded when, in January of this year, the CFTC permitted the Intercontinental Exchange (ICE), the leading operator of electronic energy exchanges, to use its trading terminals in the United States for the trading of U.S. crude oil futures on the ICE futures exchange in London—called "ICE Futures." Previously, the ICE Futures exchange in London had traded only in European energy commodities—Brent crude oil and United Kingdom natural gas. As a United Kingdom futures market, the ICE Futures exchange is regulated solely by the United Kingdom Financial Services Authority. In 1999, the London exchange obtained the CFTC's permission to install computer terminals in the United States to permit traders here to trade European energy commodities through that exchange.

Then, in January of this year, ICE Futures in London began trading a futures contract for West Texas Intermediate (WTI) crude oil, a type of crude oil that is produced and delivered in the United States. ICE Futures also notified the CFTC that it would be permitting traders in the United States to use ICE terminals in the United States to trade its new WTI contract on the ICE Futures London exchange. Beginning in April, ICE Futures similarly allowed traders in the United States to trade U.S. gasoline and heating oil futures on the ICE Futures exchange in London.

Despite the use by U.S. traders of trading terminals within the United States to trade U.S. oil, gasoline, and heating oil futures contracts, the CFTC has not asserted any jurisdiction over the trading of these contracts. Persons within the United States seeking to trade key U.S. energy commodities—U.S. crude oil, gasoline, and heating oil futures—now can avoid all U.S. market oversight or reporting requirements by routing their trades through the ICE Futures exchange in London instead of the NYMEX in New York.

As an increasing number of U.S. energy trades occurs on unregulated, OTC electronic exchanges or through foreign exchanges, the CFTC's large trading reporting system becomes less and less accurate, the trading data becomes less and less useful, and its market oversight program becomes less comprehensive. The absence of large trader information from the electronic exchanges makes it more difficult for the CFTC to monitor speculative activity and to

[12] Letter from Reuben Jeffery III, Chairman, Commodity Futures Trading Commission, to Michigan Governor Jennifer Granholm, August 22, 2005.

detect and prevent price manipulation.[13] The absence of this information not only obscures the CFTC's view of that portion of the energy commodity markets, but it also degrades the quality of information that is reported. A trader may take a position on an unregulated electronic exchange or on a foreign exchange that is either in addition to or opposite from the positions the trader has taken on the NYMEX, and thereby avoid and distort the large trader reporting system. Not only can the CFTC be misled by these trading practices, but these trading practices could render the CFTC weekly publication of energy market trading data, intended to be used by the public, as incomplete and misleading.

It is critical for U.S. policymakers, analysts, regulators, investors and the public to understand the true reasons for skyrocketing energy prices. If price increases are due to supply and demand imbalances, economic policies can be developed to encourage investments in new energy sources and conservation of existing supplies. If price increases are due to geopolitical factors in producer countries, foreign policies can be developed to mitigate those factors. If price increases are due to hurricane damage, investments to protect producing and refining facilities from natural disasters may become a priority. To the extent that energy prices are the result of market manipulation or excessive speculation, only a cop on the beat with both oversight and enforcement authority will be effective.

Extending the CFTC's Large Trader Reporting system to require all U.S. traders of energy futures or futures-like contracts to keep records and report large trades to the CFTC, regardless of where the trade takes place—on the NYMEX, on an unregulated OTC electronic exchange, or on a foreign exchange—will eliminate the gaps in large trader reporting requirements. This action is necessary to preserve the CFTC's ability to oversee energy futures markets in order to detect and prevent price manipulation and excessive speculation.

II. FINDINGS AND RECOMMENDATIONS

Based upon its investigation into the role of market speculation in rising oil and gas prices, the Subcommittee staff makes the following findings and recommendations.

A. Findings

1. Rise in Speculation. Over the past few years speculators have expended tens of billions of dollars in U.S. energy commodity markets.

2. Speculation Has Increased Prices. Speculation has contributed to rising U.S. energy prices, but gaps in available market data currently impede analysis of the specific amount of speculation, the commodity trades involved, the markets affected, and the extent of price impacts.

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[13] Enron's manipulation of prices on its unregulated electronic trading platform demonstrates the widespread economic harm that may result from abuses in unregulated markets. In 2002, for example, the Federal Energy Regulatory Commission (FERC) found that 174 trades between Enron and one other party in the last hour of trading in Enron's electronic market on January 31, 2001, resulted in a steep increase in the price of natural gas on that date. The report tentatively concluded that Enron OnLine price data was susceptible to price manipulation and may have affected not only Enron trades, but also increased natural gas prices industrywide. *See, e.g.,* August 2002 report prepared by the FERC staff, Docket No. PA–02–000.

3. Price-Inventory Relationship Altered. With respect to crude oil, the influx of speculative dollars appears to have altered the historical relationship between price and inventory, leading the current oil market to be characterized by both large inventories and high prices.

4. Large Trader Reports Essential. CFTC access to daily reports of large trades of energy commodities is essential to its ability to detect and deter price manipulation. The CFTC's ability to detect and deter energy price manipulation is suffering from critical information gaps, because traders on OTC electronic exchanges and the London ICE Futures are currently exempt from CFTC reporting requirements. Large trader reporting is also essential to analyze the effect of speculation on energy prices.

5. ICE Impact on Energy Prices. ICE's filings with the Securities and Exchange Commission and other evidence indicate that its over-the-counter electronic exchange performs a price discovery function—and thereby affects U.S. energy prices—in the cash market for the energy commodities traded on that exchange.

B. Recommendations

1. Eliminate Enron Loophole. Congress should eliminate the Enron loophole that currently limits CFTC oversight of key U.S. energy commodity markets and put the CFTC back on the beat policing these markets.

2. Require Large Trader Reports. Congress should enact legislation to provide that persons trading energy futures "look-alike" contracts on over-the-counter electronic exchanges are subject to the CFTC's large trader reporting requirements.

3. Monitor U.S. Energy Trades on Foreign Exchanges. Congress should enact legislation to ensure that U.S. persons trading U.S. energy commodities on foreign exchanges are subject to the CFTC's large trader reporting requirements.

4. Increase U.S.-U.K. Cooperation. The CFTC should work with the United Kingdom Financial Services Authority to ensure it has information about all large trades in U.S. energy commodities on the ICE Futures exchange in London.

5. Make ICE Determination. The CFTC should immediately conduct the hearing required by its regulations to examine the price discovery function of the ICE OTC electronic exchange and the need for ICE to publish daily trading data as required by the Commodity Exchange Act.

III. RECENT TRENDS IN ENERGY MARKETS

"There has been no shortage and inventories of crude oil and products have continued to rise. The increase in prices has not been driven by supply and demand."

—Lord Browne, Group Chief Executive of BP[14]

"Senator, the facts are—and I've said this publicly for a long time—the oil prices have been moving steadily up for the last 2 years. And I think I have been very clear in saying that I don't think that the fundamentals of supply and demand—at least as we have traditionally looked at it—have supported the price structure that's there."

—Lee Raymond, Chairman and CEO, ExxonMobil[15]

A. Increasing Prices

In what has become an all-too-familiar refrain over the past several years, energy prices have recently reached record highs. Oil prices in the spring of 2006 surpassed the record highs reached last summer in the days after Hurricane Katrina rampaged through the Gulf of Mexico and shut down over a million barrels per day of U.S. oil production. Figure 1 shows the steep climb and recent record highs in crude oil prices.

Figure 1. Since January 2002, crude oil prices have steadily risen; oil prices reached record high levels in spring of 2006. Prices reflect spot month NYMEX futures contract prices. Data source: U.S. Department of Energy, Energy Information Administration (EIA), NYMEX data.

[14] Melanie Feisst, *"Joseph was a speculator too," Hedge funds draw on the Bible to defend themselves against accusations that they have destablised the markets,* The Daily Telegraph, U.K., May 6, 2006.

[15] *Engergy Pricing and Profits,* Joint Hearing before the Senate Committee on Commerce, Science and Transportation and the Senate Committee and Energy and Natural Resources, November 9, 2005.

Because gasoline and other petroleum-based energy commodities are produced by refining crude oil, the rising price of crude oil has been a major cause of rising gasoline and petroleum product prices. Figure 2 illustrates how U.S. gasoline prices have increased in recent years.

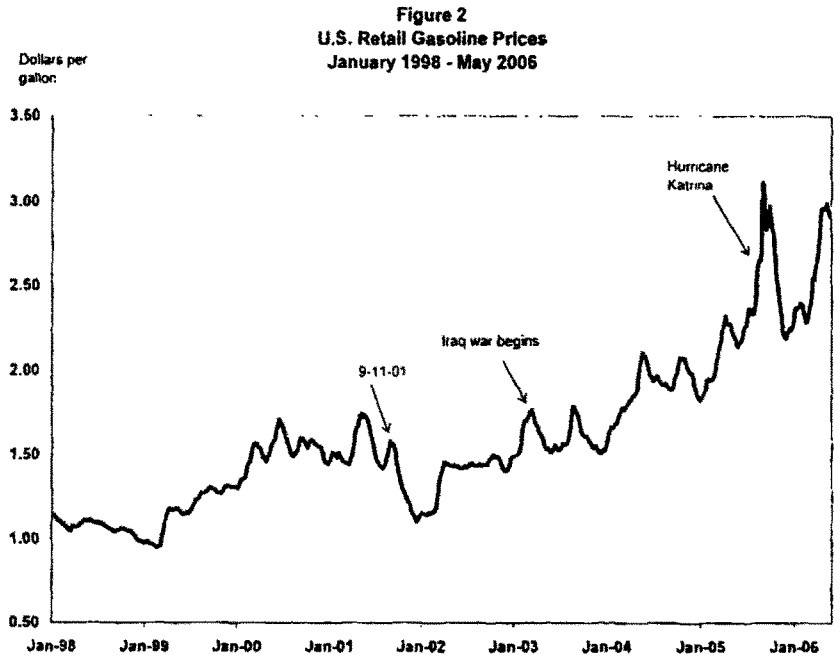

Figure 2. The average price of gasoline in the United States has risen from an average of $1.10 cents per gallon in the late 1990s to an average of over $2.20 per gallon over the past 12 months, and nearly $3 per gallon in the spring of 2006. Prices reflect the weekly average retail price for all grades of gasoline. Data source: EIA.

Natural gas prices also have jumped higher over the past several years. Because several industries, such as electric power generation, can use natural gas as a substitute for crude oil, and vice versa, natural gas prices are significantly affected by crude oil prices. Natural gas prices also are highly correlated with the prices of several petroleum products, such as diesel fuel and heating oil. Figure 3 illustrates the recent rise in natural gas prices.

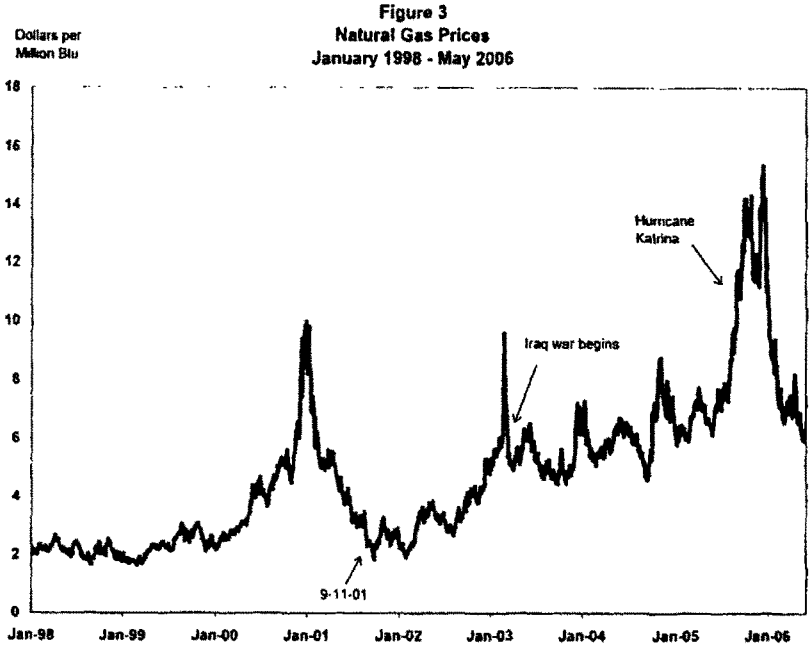

Figure 3. Natural gas prices have risen from an average of $2 per million BTU in the late 1990s to a current range of $6–$8 per million BTU in the spring of 2006. At times, price spikes have doubled the price of natural gas. Prices reflect spot month NYMEX futures contract prices. Data source: EIA, NYMEX data.

A number of factors are often cited as contributing to these increasing prices.[16] Generally, the rising prices are attributed to an increasingly precarious balance between supply and demand. Global demand for oil has been increasing, led by the rapid industrialization of China, growth in India, and a continued increase in appetite for refined products, particularly gasoline, in the United States.[17] Although supplies have been increasing to keep pace with this increased demand,[18] these supplies are perceived to be increasingly vulnerable to disruption. Political instability and hostility to U.S. interests in the key producer countries of Iran, Iraq,

[16] *See, e.g.,* U.S. Department of Energy, Energy Information Administration (EIA), *Short-Term Energy Outlook and Summer Fuels Outlook,* April 2006 (*2006 Summer Fuels Outlook*), at pp. 2–3; Jeffrey H. Birnbaum and Steven Mufson, *Cost of Gas Puts Pressure on GOP,* The Washington Post, April 25, 2006; BBC News, *What is driving oil prices so high?,* http://news.bbc.co.uk/go/pr/fr/-/1/hi/business/4922172.stm (April 20, 2006); Peg Mackey and Janet McBride, Reuters, *Oil's top brass talk prices at summit,* Saturday, April 22, 2006, 9:33 a.m.; Steven Mufson, *The Battle Over the Blame for Gas Prices,* The Washington Post, Friday, April 21, 2006, at p. A01.

[17] *See, e.g.,* Philip K. Verleger, Jr., *A Primer on Oil Prices: I,* The Petroleum Economics Monthly, December 2005; International Energy Agency (IEA), *Oil Market Report,* May 12, 2006, at p. 3.

[18] For example, from 2002 through 2005 global demand increased from 77.8 to 83.6 million barrels per day (bpd), while global supply increased from 76.9 to 84 million bpd. This represents an increase in demand of 5.8 million bpd, and an increase in supply of 7.1 million bpd. As a result, OECD inventories grew by 300,000 bpd in 2003 and 200,000 bpd in 2004 and 2005. *Id.,* at p. 43.

Venezuela,[19] and Nigeria[20] are among the most frequently cited threats to supplies. Additionally, in each of the past 2 years hurricanes have disrupted U.S. oil and gas production in the Gulf of Mexico.[21] As Saudi Arabia has increased its rate of production to meet increasing demand, its ability to pump additional oil in the event of a shortfall elsewhere has declined, thereby providing less of a cushion in the event of such a supply disruption.[22] It is often asserted that these and other fears over the adequacy of supply have built a "risk premium" into crude oil prices.[23]

These factors, however, do not tell the whole story. Concurrent with the most recent sustained run-up in energy prices, large financial institutions, hedge funds, pension funds, and other investors have been pouring billions of dollars into the energy commodities markets to try to take advantage of price changes or hedge against them. Most of this additional investment has not come from producers or consumers of these commodities, but from speculators seeking to take advantage of these price changes. The CFTC defines a speculator as a person who "does not produce or use the commodity, but risks his or her own capital trading futures in that commodity in hopes of making a profit on price changes."[24] Reports indicate that in the past year a few speculators have made tens

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[19] Monte Reel, *Chavez Stokes Confrontation Over U.S. Role in Venezuela,* The Washington Post, July 19, 2005.

[20] *See, e.g.,* Matt Piotrowski, *Nigerian Shut-Ins Fail to Stimulate Oversupplied US Cash Crude Market,* Oil Daily, March 6, 2006. This spring, however, despite several well-publicized disruptions to Nigerian supplies, no shortfalls resulted. "'Physical traders have taken the Nigerian outage totally in stride,' [one trader] said. 'Without the Nigerian troubles, there would be even more oversupply.'" *Id.*

[21] Between August 26, 2005 and April 19, 2006, the cumulative loss of production in the Gulf of Mexico due to Hurricane Katrina was approximately 149 million barrels, or approximately 1 million barrels per day (bpd). U.S. Department of Interior Materials and Management Service (MMS), Hurricane Katrina/Hurricane Rita, Evacuation and Production Shut-in Statistics Report, Wednesday, April 19, 2006, at http://www.mms.gov/ooc/press0419.htm. Nearly 90 percent of total Gulf of Mexico oil production, which normally is about 1.5 million bpd, was shut down in the first few days after landfall on August 29; nearly 56 percent, or about 840,000 bpd, was still shut-in (i.e., unable to be produced) on September 15, 2 weeks after landfall. U.S. Department of Energy, Office of Electricity Delivery and Energy Reliability, Energy Assurance Daily, September 15, 2005, at pp. 2–3.

In the 6-month period between September 11, 2004 and February 14, 2005, Hurricane Ivan caused a cumulative loss of nearly 44 million barrels of crude oil production in the Gulf of Mexico, which was equivalent to about 7.2 percent of the annual production of oil in the Gulf. MMS, Hurricane Ivan Evacuation and Production Shut-in Statistics as of Monday, February 14, 2005, Final Report, at http://www.mms.gov/ooc/press/2005/press0214.htm.

The International Energy Agency (IEA) states that "random events," such as accidents, labor unrest, "guerilla activity," unplanned maintenance, and weather-related events, including hurricanes in North America, "may cause supply losses of between 300 kb/d [thousand barrels per day] and 400 kb/d for non-OPEC supply each year." IEA, *Oil Market Report,* May 12, 2006, at p. 14.

[22] *2006 Summer Fuels Outlook,* at p. 3. On the other hand, government-controlled strategic stocks, including the U.S. Strategic Petroleum Reserve, are at historically high levels. *2006 Summer Fuels Outlook, Summer Fuel Charts,* at p.3 and at Summer Fuel Charts, p. 9; IEA, *Oil Market Report,* March 14, 2006, at p. 59. In the event of a disruption in supply, these strategic stocks can be just as effective as using spare production capacity to make up for production shortfalls. For example, in 2005, the United States released 30 million barrels of oil from the U.S. Strategic Petroleum Reserve, and other IEA members released another 30 million barrels to compensate for the loss of production caused by Hurricanes Katrina and Rita. H. Josef Hebert, *Nations to Release 60M Barrels of Oil, Gas,* Associated Press Financial Wire, September 2, 2005, 10:51 p.m. GMT. In 2003, Saudi Arabia and other OPEC members increased their production to compensate for the temporary loss of about 1.7 million barrels per day of Iraq oil due to the American invasion. David Ivanovich, *OPEC strives to prevent world oil-supply shortage,* Houston Chronicle, March 10, 2003; *Producers Expect Minimal War Diruption,* Oil Daily, March 19, 2003.

[23] *See, e.g.,* Daniel Yergin, Testimony Before the U.S. House of Representatives Committee on Energy and Commerce, May 4, 2006, at www.cera.com/news (last visited May 22, 2006).

[24] CFTC, The Economic Purpose of Futures Markets, at http://www.cftc.gov/opa/brochures/opaeconpurp. htm.

and perhaps hundreds of millions of dollars trading in oil and gas.[25]

The large purchases of crude oil futures contracts by speculators have, in effect, created an additional demand for oil, driving up the price of oil for future delivery in the same manner that additional demand for contracts for the delivery of a physical barrel today drives up the price for oil on the spot market. As far as the market is concerned, the demand for a barrel of oil that results from the purchase of a futures contract by a speculator is just as real as the demand for a barrel that results from the purchase of a futures contract by a refiner or other user of petroleum.

Although it is difficult to quantify the effect of speculation on prices, there is substantial evidence supporting the conclusion that the large amount of speculation in the current market has significantly increased prices; several analysts have estimated that speculative purchases of oil futures have added as much as $20–$25 per barrel to the current price of crude oil. Additionally, by purchasing large numbers of futures contracts, and thereby pushing up futures prices to even higher levels than current prices, speculators have provided a financial incentive for oil companies to buy even more oil and place it in storage. A refiner will purchase extra oil today, even if it costs $70 per barrel, if the futures price is even higher.

As a result, over the past 2 years, crude oil inventories have been steadily growing, resulting in U.S. crude oil inventories that are now higher than at any time in the previous 8 years. The last time crude oil inventories were this high, in May 1998—at about 347 million barrels—the price of crude oil was about $15 per barrel. By contrast, the price of crude oil today is about $70 per barrel. The large influx of speculative investment into oil futures has led to a situation where we have both high supplies of crude oil and high crude oil prices.

High crude oil prices are a major reason for the record or near-record highs of the prices of a variety of petroleum products, including gasoline, heating oil, diesel fuel, and jet fuel.[26] There also is evidence that the skyrocketing prices of metal commodities can partially be attributed to these skyrocketing oil prices.[27]

B. Increasing Amounts of Crude Oil in Storage

"What's been happening since 2004 is very high prices without record-low stocks. The relationship between U.S. [oil] inventory levels and prices has been shredded, has become irrelevant."

—Jan Stuart, Global Oil Economist, UBS Securities[28]

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[25] *See* Section III.C.3 in this report, below.

[26] As explained in two previous reports issued by the Subcommittee staff, U.S. gasoline prices are also influenced by the overall gasoline supply and demand balance within the U.S. gasoline market, which in turn depends on a variety of other factors, including the profitability of refinery operations, domestic refinery capacity and availability, the level of imports, competition within the industry at the national and local level, and fuel specifications resulting from environmental requirements that affect the fungibility of gasoline supplies. This year, uncertainty within the market regarding whether there would be an adequate supply of gasoline blended with ethanol to replace the supply of gasoline blended with MTBE also contributed to some of the increases in gasoline prices.

[27] *See, e.g., Falling oil prices would help stem rise in copper prices: trader,* Platts Metals Week, May 19, 2006, at http://www.platts.com/Metals/highlights/2006/mp—mw—051906.xml (last visited May 26, 2006).

[28] Bhusan Bahree and Ann Davis, *Oil Settles Above $70 a Barrel, Despite Inventories at 8-Year High,* The Wall Street Journal, April 18, 2006.

Compelling evidence that the oft-cited geopolitical, economic, and natural factors do not fully explain the recent rise in energy prices can be seen in the actual data on crude oil supply and demand. Although demand has significantly increased over the past few years, so have supplies. As Figure 4 indicates, over the past couple of years global crude oil production has increased along with the increases in demand; in fact, during this period global supplies have exceeded demand.[29]

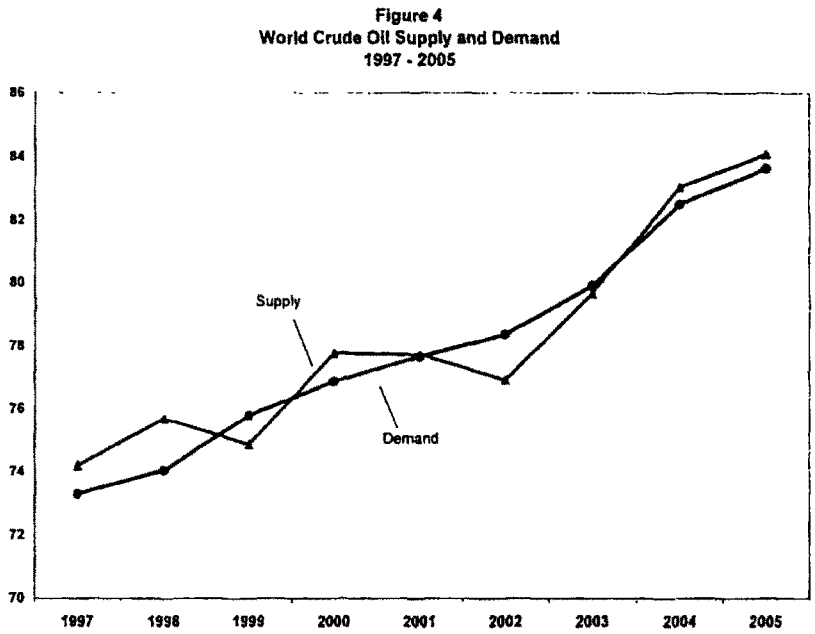

Figure 4. In 2004 and 2005 the supply of crude oil exceeded demand. Data source: *EIA, International Petroleum Monthly,* March 2006.

Projections for the future indicate that, for the near term, supply will continue to keep pace with demand. In its monthly report for March 2006, the International Energy Agency (IEA), stated, "Additions to OPEC and non-OPEC capacity are forecast to keep global supply trends broadly in line with global demand in 2007 and 2008."[30] The U.S. Department of Energy's Energy Information Administration (EIA) recently forecast that in the next few years global surplus production capacity will continue to grow to between 3 and 5 million barrels per day by 2010, thereby "substantially thickening the surplus capacity cushion."[31]

Because supplies have been rising along with demand, commercial crude oil inventories have been rising as well. As can be seen in Figure 5, the amount of crude oil in U.S. commercial inventories

[29] *2006 Summer Fuels Outlook,* at p. 3.

[30] IEA, *Oil Market Report,* March 14, 2006, at p. 3. *See also, 2006 Summer Fuels Outlook,* at p. 3.

[31] EIA, *Energy Assurance Daily,* May 4, 2006. The EIA reported the current spare capacity to be between 1 and 1.5 million barrels per day (bpd). *Id.* The International Energy Agency reports the spare capacity at 1.7 million bpd. IEA, *Oil Market Report,* May 12, 2006, at p. 14.

is higher today than at any other time in the current decade. The EIA forecasts that U.S. inventories will increase again in 2006.[32]

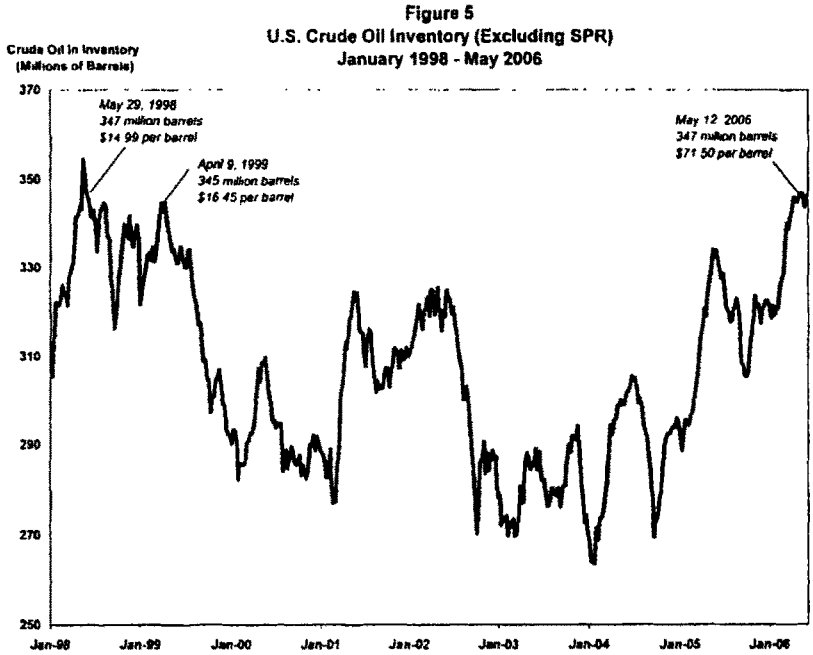

Figure 5. The amount of crude oil in storage in commercial inventories has risen to higher-than-average levels over the past year. Data source: EIA.

The amount of natural gas in storage also has been increasing over the past couple of years. From mid-2004 to the present, except for the period shortly following the landfall of Hurricane Katrina, the amount of natural gas in storage has exceeded the previous 5-year average.[33] Yet during this entire period natural gas prices were higher than the previous 5-year average. These trends are expected to continue. Despite a projected increase in the amount of natural gas available in storage for next winter, the EIA states that "concerns about potential future supply tightness and continuing pressure from high oil markets are keeping expected spot natural gas prices for the next heating season at high levels."[34]

Figure 6 shows the relationship between U.S. crude oil inventories and prices over the past 8 years, and how the relationship between physical supply and price has fundamentally changed since 2004. For the period from 1998 through 2003, the chart

[32] *2006 Summer Fuels Outlook,* at Table 3. In Europe, crude oil in inventories also were higher in 2005 than in either 2003 or 2004. IEA, *Oil Market Report,* March 14, 2006, at p. 29. Not only are the absolute levels of U.S. and European inventories above average, inventories are also higher when measured by days-of-supply those inventories could provide at current consumption levels. *Id.* In June, the IEA reported that OECD crude stocks had risen to their highest level in 20 years. IEA, *Oil Market Report Highlights,* June 13, 2006.

[33] EIA, *Short-Term Energy Outlook and Summer Fuels Outlook,* April 2006, Summer Fuel Charts, at p.11.

[34] *2006 Summer Fuels Outlook,* at Table 3. In mid-May of this year, however, natural gas spot month futures fell below $6 per million BTU.

shows that the price-inventory relationship generally centered around a line sloping from the middle-left of the chart down to the lower right, meaning that low inventories were accompanied by high prices, and high inventories were accompanied by low prices. For 2004, 2005, and through May 2006, which is the most recently available data, the inventory-price relationships fall nowhere near this downward sloping line; if anything, the points seem to go in the opposite direction, such that higher inventories seem to be correlated with higher prices. Figure 6 clearly indicates that there has been a fundamental change in the oil industry, such that the previous relationship between price and inventory no longer applies.

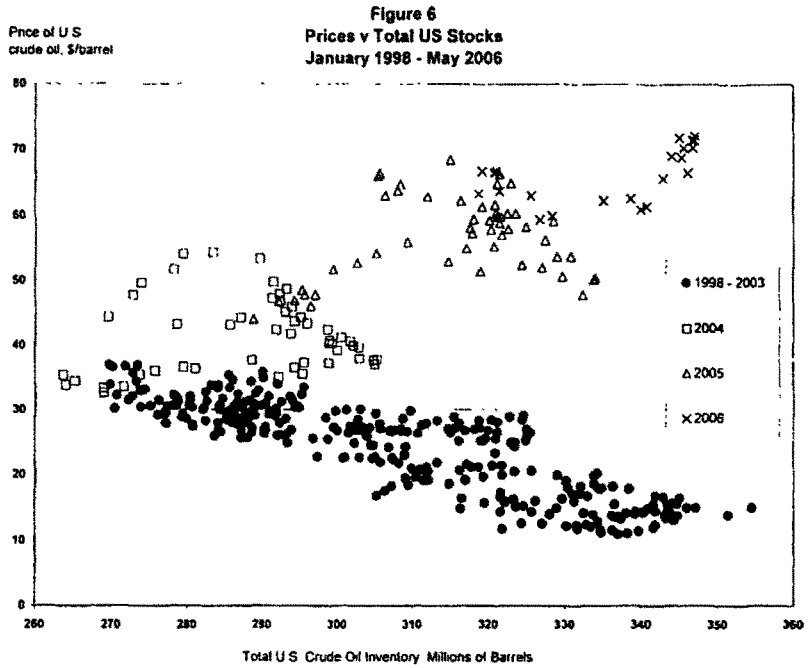

Figure 6. Since 2004, crude oil prices have risen as inventories have risen. Data source: EIA.

As will be discussed in the next section, one reason underlying this change is the influx of billions of dollars of speculative investment in the crude oil and natural gas futures markets. As energy prices have not only increased but become more volatile, energy commodities have become an attractive investment for financial institutions, hedge funds, pension funds, commodity pools, and other large investors. One oil economist has calculated that over the past few years more than $60 billion has been spent on oil futures in the NYMEX market alone.[35] As explained below, this frenzy of speculative buying has created additional demand for oil futures, thereby pushing up the price of those futures. The increases in the

[35] Philip Verleger, *Commodity Investors: A Stabilizing Force?*, The Petroleum Economics Monthly, March 2006.

price of oil futures have provided financial incentives for companies to buy even more oil and put it into storage for future use, resulting in high prices despite ample inventories.[36]

C. Increased Speculation in Energy Commodities

"Ironically, hedge funds trading oil are not doing anything very different than the large investment banks such as Goldman Sachs, Bank of America, or Morgan Stanley already do. The proprietary trading desks of these and other large investment banks are actually "hedge funds in drag," just as Enron was."

—Peter C. Fusaro and Gary M. Vasey, Hedge Funds Change Energy Trading[37]

1. Increased Investments in Energy Commodities

At the same time energy commodity prices have been increasing, there has been a large increase in the amount of money expended on energy commodities futures and other derivative instruments. "Volatile energy markets and record-high commodity prices are prompting renewed interest from investors eager to play in the sector," *The New York Times* reported earlier this year. "That has pushed banks and a growing number of hedge funds to hire more energy traders and brainy quantitative minds to back their bets on energy prices."[38] Recent academic research indicating that commodity futures have performed as well as stocks and better than bonds, with less risk, also has boosted expenditures on energy commodity futures.[39]

Because the over-the-counter energy markets are unregulated, there are no precise or reliable figures as to the total dollar value of recent spending on investments in energy commodities, but the

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[36] Some traders contend that the high inventories have lowered spot prices. "The physical market is pretty relaxed," one trader said this spring, as prices rose over $60 per barrel. "There's been downward pressure on WTI [West Texas Intermediate] because of inventories." Matt Piotrowski, Nigerian Shut-Ins Fail to Stimulate Oversupplied US Cash Crude Market, Oil Daily, March 6, 2006. "What the high stock levels are doing, along with unsold spot cargoes and storage capacity constraints, is driving down the spot and front month prices relative to the outer months. In effect, a chunk of the fear premium is being taken out of the market." Receding Fear Premium, Petroleum Intelligence Weekly, March 13, 2006.

On the other hand, by creating a financial incentive to purchase oil for storage, the steep rise in futures prices may also have stimulated current demand, thereby pushing up current prices. Although some of this increased demand for oil—for present consumption plus for future consumption—has been met by increase in supply, any increase in production necessary to meet this additional demand has come at a time of low excess global excess production capacity. The recent decline in global excess production capacity has been one of the major factors supporting current price levels. *See, e.g.,* Verleger, *A Primer on Oil Prices: I,* at p. 22. ("This process of inventory building [due to speculative purchases of futures contracts] reduces the supply of certain crudes and products available to the current spot market when current supply cannot be increased, as has been the case in 2005. This promotion of inventory holding raises current spot prices.").

Using the IEA estimate of 1.7 million bpd for OPEC's surplus production capacity, an amount of oil equivalent to between 10 and 15 percent of OPEC's surplus capacity has been placed into commercial inventories. It is not apparent why these increases in commercial inventories, together with the high level of strategic reserves in OECD countries, including the U.S. Strategic Petroleum Reserve, have not had a greater effect in alleviating the "fear premium" regarding potential supply disruptions.

[37] International Research Center for Energy and Economic Development, 2005.

[38] Alexei Barrionuevo and Simon Romero, *Energy Trading, Without a Certain "E",* The New York Times, January 15, 2006.

[39] Michael R. Sesit, *Commodities Enter Investment Mainstream, Pension Funds, Universities Jump Into the Asset Class; High Returns, Low Risk,* Wall Street Journal, September 9, 2004; Philip Verleger, *Commodity Investors: A Stabilizing Force?,* The Petroleum Economics Monthly, March 2006. The most frequently cited research papers are Thomas Schneeweis, Georgi Georgiev, *The Benefits of Managed Futures,* June 10, 2002; and Gary Gorton and K. Geert Rouwenhorst, *Facts and Fantasies about Commodity Futures,* Yale International Center for Finance, Working Paper No. 04–20, June 14, 2004.

estimates are consistently in the range of tens of billions of dollars. Last fall, the International Monetary Fund reported, "Industry estimates suggest that approximately $100–$120 billion of new investment in the past 3 years has been in active and passive energy investment vehicles."[40] *The New York Times* cited an estimate that there were "at least 450 hedge funds with an estimated $60 billion in assets focused on energy and the environment, including 200 devoted exclusively to various energy strategies."[41]

The increased speculative interest in commodities is also seen in the increasing popularity of commodity index funds, which are funds whose price is tied to the price of a basket of various commodity futures. Goldman Sachs estimates that pension funds and mutual funds have invested a total of approximately $85 billion in commodity index funds, and that investments in its own index, the Goldman Sachs Commodity Index (GSCI), has tripled over the past few years to $55 billion.[42] In March of this year, petroleum economist Philip Verleger calculated that the amount of money invested in commodity index funds "jumped from $15 billion in 2003 to $56 billion in 2004 and on to $80 billion today."[43]

With respect to crude oil in particular, Verleger estimates that, during 2005, $25 billion was "injected" into the West Texas Intermediate (WTI) crude oil futures contract traded on the NYMEX, mostly coming from pension funds and other managed money. Verleger states "another $20 billion or so" was invested in NYMEX WTI contracts in the first few months of this year.[44] Overall, Verleger estimates that between July 2004 and mid-March 2006, a total of approximately $60 billion has been invested in the NYMEX WTI contract.[45]

The increase in speculative trading is directly observable in the CFTC weekly reports on trading activity in the CFTC-regulated futures markets. Over the past 2 years, the CFTC data shows more than a doubling in the "open interest" in both crude oil and natural gas contracts—essentially the number of outstanding futures contracts at the end of a trading day.[46] The CFTC data indicates that much of the increase is due to "non-commercial" trading—namely, trading by speculators.[47]

2. The Effect of Speculation on Prices

"There is little doubt that Katrina only exacerbated a troubling trend in energy prices that already seemed to ignore basic fundamental drivers to thrive instead on hype."

—A futures trader, September 2005.[48]

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[40] Pelin Berkma, Sam Ouliaris, and Hossein Samiei, *The Structure of the Oil Market and Causes of High Prices*, International Monetary Fund, September 21, 2005.

[41] Alexei Barrionuevo, *Energy Trading, Without a Certain "E"*, The New York Times, January 15, 2006 (citing Mr. Peter Fusaro of the Energy Hedge Fund Center).

[42] Jad Mouawad and Heather Timmons, *Trading Frenzy Adding to Rise in Price of Oil*, The New York Times, April 29, 2006.

[43] Philip Verleger, *Commodity Investors: A Stabilizing Force?*, The Petroleum Economics Monthly, March 2006.

[44] Philip Verleger, *A Primer on Oil Prices II: The Role of Inventories*, The Petroleum Economics Monthly, February 2006, at p. 20.

[45] Verleger, March 2006.

[46] *See* the Appendix to this Report for a more detailed discussion of open interest.

[47] *See* the Appendix to this Report for a more detailed discussion of this CFTC data.

[48] *Behind Runaway Prices: Supply Issues are Real, But Hype Sets Bar*, Natural Gas Week, September 5, 2005.

One of the benefits of speculative trading is that it brings needed liquidity to the futures market so that companies seeking to hedge their exposure to commodity prices can find counterparties willing to take on those price risks. Also, as previously discussed, speculation can help finance the build-up of inventories when prices are expected to increase. On the other hand, large speculative buying or selling of futures contracts can distort the price signals influencing supply and demand in the physical market or lead to excessive price volatility, either of which can cause a cascade of consequences detrimental to the supply and price of the commodity and the overall economy.

A key responsibility of the CFTC is to ensure that prices on the futures market reflect the laws of supply and demand rather than manipulative practices[49] or excessive speculation.[50] The Commodity Exchange Act (CEA) states, "Excessive speculation in any commodity under contracts of sale of such commodity for future delivery . . . causing sudden or unreasonable fluctuations or unwarranted changes in the price of such commodity, is an undue and unnecessary burden on interstate commerce in such commodity."[51] The CEA directs the CFTC to establish such trading limits "as the Commission finds are necessary to diminish, eliminate, or prevent such burden."[52]

A number of energy industry participants and analysts have noted the divergence between the ample supplies of crude oil and natural gas, and record-high prices for those commodities, and have attributed some of this disconnect to the presence of speculators in the market. "Gold prices don't go up just because jewelers need more gold, they go up because gold is an investment," one consultant said. "The same has happened to oil."[53]

"The answer to the puzzle posed by rising prices and inventories, industry analysts say, lies not only in supply constraints such as the war in Iraq and civil unrest in Nigeria and the broad upswing in demand caused by industrialization of China and India. Increasingly, they say, prices also are being guided by a continuing rush of investor funds in commodities investments."[54] Another gas trader said: "It's all about futures speculators shooting for irrational price objectives, as well as trying to out-think other players—sort of like a twisted game of chess." "[T]he basic facts are clear," he added, "this market is purely and simply being controlled by over-speculation."[55] Tim Evans, senior analyst at IFR Energy Services, stated, "What you have on the financial side is a bunch of money being thrown at the energy futures market. It's just pulling in more and more cash. That's the side of the market where we have runaway demand, not on the physical side."[56]

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[49] 7 U.S.C. § 5(b),
[50] 7 U.S.C. § 6a(a).
[51] *Id.*
[52] *Id.*
[53] Jad Mouawad and Heather Timmons, *Trading Frenzy Adding to Rise in Price of Oil,* The New York Times, April 29, 2006 (quoting Roger Diwan, partner, PFC Energy).
[54] Bhusan Bahree and Ann Davis, *Oil Settles Above $70 a Barrel, Despite Inventories at 8-Year High,* The Wall Street Journal, April 18, 2006.
[55] *Behind Runaway Prices: Supply Issues are Real, But Hype Sets Bar,* Natural Gas Week, September 5, 2005.
[56] *Oil: A Bubble, not a Spike?* BusinessWeek online, April 27, 2005.

Some traders charge that certain hedge fund managers have purposefully contributed to a misperception that there is a shortage of supply. "There's a few hedge fund managers out there who are masters at knowing how to exploit the peak theories [that the world is running out of oil] and hot buttons of supply and demand, (and) by making bold predictions of shocking price advancements to come (they) only add more fuel to the bullish fire in a sort of self-fulfilling prophecy."[57]

Several analysts have estimated that the influx of speculative money has tacked on anywhere from about $7 to about $30 per barrel to the price of crude oil.[58] Even OPEC officials are concerned that a shift in the market from high futures prices relative to current prices, to lower futures prices relative to current prices (i.e. from contango to backwardation) could precipitate a "quick drop of $20 a barrel or more."[59] Noting that "fundamentals are in balance and stock levels are comfortable," the president of the OPEC cartel, Edmund Daukoru, recently attributed the current price levels to "refinery tightness, geopolitical developments and speculative activity."[60] Other traders have pointed out the possibility of a sharp drop in price. "At some point, this oversupplied market has to begin to break down this house of cards which is dominated by speculative entities," one futures trader noted, "and when those entities decide to start liquidating their futures positions in crude and gas, look out below."[61]

Generally, economists struggle to quantify the effect of speculators on market prices. Part of the difficulty is due to the absence of specific data about the strategies of particular traders or classes of traders. The CFTC's weekly Commitment of Trader Reports are not specific or precise enough to provide the basis for rigorous quantitative analysis,[62] and commodity traders are, as a rule, reluctant to distribute their data for such purposes. Another difficulty is separating cause from effect: are high prices caused by an increase in speculation, or do more speculators enter the market

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[57] *Natural Gas Week*, September 5, 2005.

[58] *See, e.g.*, Jad Mouawad and Heather Timmons, *Trading Frenzy Adding to Rise in Price of Oil*, The New York Times, April 29, 2006 ("by some estimates 10 percent to 20 percent" of current prices); Goldman Sachs, *Natural Gas Weekly*, December 10, 2004 ($7 per barrel in spring, 2004); John M. Berry, *Speculation plays a role in high oil prices*, Alexander's Gas & Oil Connections, August 17, 2005 ("'Current US oil inventory levels suggest WTI crude prices should be around $25 a barrel,' [oil analyst Mike Rothman of International Strategy and Investment] calculated. 'Given underlying issues and concerns about OPEC capacity and demand growth, we certainly are not prepared to argue that the price spread between the $25 model value and near $60 actual is all speculation, but we do feel that a portion is.'"); *Oil Pricing: Don't Underestimate the Fear Factor*, BusinessWeek online, March 13, 2006 (Sarah Emerson, director of petroleum market analysis and research at Energy Security Analysis estimates an additional $15 per barrel is due to "fear;" Tim Evans, senior energy analyst for IFR Markets, estimates $25–$30 per barrel.).

[59] Bhusan Bahree and Ann Davis, *Oil Settles Above $70 a Barrel, Despite Inventories at 8-Year High*, The Wall Street Journal, April 18, 2006.

[60] Platts, *OPEC has no option but to maintain output at current prices: Libya*, June 15, 2006. Similarly, Saudi Arabian Oil Minister Ali Naimi has stated, "World oil supply is currently exceeding demand, and there is no lack of spare capacity." Kate Dourian, *Naimi says producers can't be assured robust demand will continue*, Platts Oilgram News, May 16, 2006. U.S. Energy Secretary Samuel Bodman agreed with Minister Naimi's assessment: "[Secretary] Bodman, meeting with reporters after a speech at an electricity forum, suggested that there seems to be plenty of oil available." H. Josef Hebert, *Energy secretary says U.S. can weather Iranian oil disruption*, Associated Press Worldstream, June 6, 2006.

[61] *Bears Predict Bullish Crude, Gas Bubble to Burst Sooner Than Later*, Natural Gas Week, June 27, 2005.

[62] *See* the Appendix for an explanation of these reports.

when prices become more volatile because that is when the profit opportunities arise?

Several recent analyses have concluded that speculation has significantly increased energy prices; others have concluded otherwise.

Former Federal Reserve Chairman Alan Greenspan. In testimony before the Senate Committee on Foreign Relations, former Chairman Greenspan stated that, in the last couple of years, "increasing numbers of hedge funds and other institutional investors began bidding for oil [and] accumulated it in substantial net long positions in crude oil futures, largely in the over-the-counter market. These net long futures contracts, in effect, constituted a bet that oil prices would rise."[63] The former Chairman observed that these purchases of oil futures have had a cascade of effects on prices, production, inventories, and consumption:

> With the demand from the investment community, oil prices have moved up sooner than they would have otherwise. In addition, there has been a large increase in oil inventories. In response to higher prices, producers have increased production dramatically and some consumption has been scaled back. Even though crude oil productive capacity is still inadequate, it, too, has risen significantly over the past 2 years in response to price.[64]

Citgroup. In a May 5, 2006 report on prices of U.S. commodities, Citigroup reported that the monthly average value of speculative positions held in all U.S. commodity markets rose to over $120 billion, just under the record of $128 billion set the previous October. Of the 36 agricultural, energy, and metal commodities analyzed, Citigroup found the largest speculative positions were in natural gas ($30.3 billion) and crude oil ($30.1 billion), followed by gold ($13.3 billion). The report stated, "We believe the hike in speculative positions has been a key driver for the latest surge in commodity prices."

Goldman Sachs. In a report on the natural gas markets issued in late 2004, Goldman Sachs determined that the rising natural gas prices—which were then near $7 per million BTU—were "rooted in tightening fundamentals."[65] Goldman Sachs also stated, "Our analysis indicates that speculative money does have some impact on natural gas prices and the shape of the forward curve." Goldman Sachs reported that the net-speculative positions had depressed the next-month natural gas futures contract price by $0.28 per million BTU in early December 2004, but the previous spring it had increased the "prompt" NYMEX natural gas futures contract (i.e., the futures contract that is next to expire) by $0.60 per million BTU—an increase of slightly greater than 10 percent.

The Goldman Sachs report also noted that natural gas prices were directly affected by crude oil prices, and "we believe that speculators also impact the price of crude oil and petroleum products, with the impact of speculators peaking at roughly $7 [per barrel]

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[63] Statement of Alan Greenspan *Oil Depends on Economic Risks,* Hearing before the Senate Committee on Foreign Relations, June 7, 2006.

[64] *Id.*

[65] Goldman Sachs, *Natural Gas Weekly,* December 10, 2004.

in the spring of 2004." At that time, crude oil prices ranged from $35–$40 per barrel; hence, according to the Goldman Sachs analysis, speculators at that time were boosting the price of oil by about 20 percent. "Unlike natural gas," Goldman Sachs wrote, "we estimate that the impact of speculators on oil prices is roughly equivalent in magnitude to the impact of shifts in supply and demand fundamentals (as reflected in stocks)." In other words, shifts in speculative positions could affect crude oil to the same degree as actual changes in the supply of or demand for crude oil.

Philip Verleger: A New Era for Energy. In a series of analyses in his publication, The Petroleum Economics Monthly, Philip Verleger contends that the recent increase in speculative activity has altered the nature of the crude oil markets and boosted futures prices. Verleger believes that the recent infusion of tens of billions of dollars from pension funds, speculators, and other investors into crude oil and natural gas futures markets has ushered in a "new era" for energy producers and refiners. "The current new era is marked by the entry of long-term investors, who have pushed forward crude prices to record levels," Verleger writes. "Consumers, no doubt, will have another term for it."[66] During this era "prices will likely be quite high for several years," but "will be followed by a period of very low prices."[67]

A key indicator of this new era, according to Verleger, is the emergence of a "'disconnect' between the cash price behavior and the fundamentals, as measured by supply-and-demand balances or stocks."[68] The reason for this divergence, in Verleger's analysis, is that purchases of long-term crude oil futures contracts have pushed up the longer-term futures prices by so much that it is more profitable for oil companies to store the oil and then sell it at a later date than sell it today, even at record-high spot prices. Even if oil is at $70 per barrel today, suppliers will hold their inventories if they can sell it for $75 for delivery a year from now.

Since 2001 there has been a dramatic growth in the open interest in very long-term futures contracts (30 months or longer). At the end of July 2001, there was an open interest of 19,624 in very long-term contracts, representing about 4.5 percent of all open interest; at the end of July 2005, there was an open interest of 125,546 in very long-term contracts, representing about 15 percent of all open interest. According to Verleger, nearly all of the buying of these very long-term crude oil futures contracts reflects speculative buying, since commercial firms typically don't enter into contracts for delivery so far into the future, and therefore have no need to use such long-term futures contracts for hedging purposes.[69]

"In summary," Verleger writes, "increased purchases of long-dated crude lift the forward price curve. The rise in prices is reflected back to contracts maturing in a few months."[70] Quantitatively, "the impact of increasing stocks has been overwhelmed

[66] Philip K. Verleger, Jr., *The Petroleum Economics Monthly*, July 2005, at p. 1.
[67] *Id.*, at p. 2.
[68] *Id.*, at p. 10.
[69] *Id.*, at p. 12.
[70] *Id.*, at p. 15.

by the strong demand for forward crude, which has added as much as $24 per barrel to prices."[71]

CFTC staff study. In contrast to the studies that have found a relationship between speculative activity and price, a CFTC staff study released in April 2005 found, in general, "no evidence of a link between price changes and MMT [managed money trader] positions" in the natural gas markets and "a significantly negative relationship between MMT positions and price changes (conditional on other participants trading) in the crude oil market."[72] The CFTC staff found, generally, that these managed money funds tended to follow what the commercial participants in the market were doing, and tended to trade less frequently than commercial traders.

NYMEX study. A second study that found no relationship between hedge fund activity and volatility was conducted by the NYMEX. Overall, the NYMEX found that during 2004, "hedge fund trading activity comprised a modest share of trading volume in both crude oil and natural gas futures markets," and comprised "a relatively modest share of open interest." It also found that hedge fund participation during this period tended to decrease volatility. "In short," the NYMEX stated, "it appears that Hedge Funds have been unfairly maligned by certain quarters who are seeking simple answers to the problem of substantial price volatility in energy markets, simple answers that are not supported by the available evidence."[73]

A number of industry participants have expressed skepticism about the accuracy of the NYMEX and CFTC analyses. Neither the NYMEX study nor the CFTC study addressed the effects of hedge fund and other speculative investments on the price of longer-term futures contracts. Rather, both the CFTC study and the NYMEX focused on the near-term effects of trading by hedge funds, particularly with respect to volatility. "[D]espite those [NYMEX and CFTC] reports," one trade publication reported, "a majority of industry professionals still contend that there are too many large speculative entities actively engaged in the market—with fund accounts taking on massive equity positions in the commodities."[74] Another article reported that many traders have "scoffed" at these two studies, "saying that they focused only on certain months, missing price run-ups."[75]

In sum, while industry and regulatory economists and analysts do not agree on the extent to which market speculation has affected energy prices, it is beyond dispute that speculation has increased. CFTC data as well as numerous industry reports indicate

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[71] *Id.*, at p. 19.

[72] Michael S. Haigh, Jana Hranaiova and James A. Overdahl, Office of the Chief Economist, U.S. Commodity Futures Trading Commission, *Price Dynamics, Price Discovery and Large Futures Trader Interactions in the Energy Complex*, Working Paper, First Draft: April 28, 2005.

[73] New York Mercantile Exchange, *A Review of Recent Hedge Fund Participation in NYMEX Natural Gas and Crude Oil Futures Markets*, March 1, 2005.

[74] *Bears Predict Bullish Crude, Gas Bubble to Burst Sooner Than Later*, Natural Gas Week, June 27, 2005. *See, e.g., Oil Market Control Passes From OPEC to Speculators*, Jet Fuel Intelligence, August 29, 2005 ("'The amount of paper barrels being traded is extraordinary and this has had an extraordinary effect on prices,' said one industry veteran."); *Commodity Strategists: Oil to Fall, Toronto Bank Says*, Bloomberg.com, April 25, 2005 (the speculative rally has "'decoupled" prices from the reality of supply and demand.").

[75] Alexei Barrionuevo, *Energy Trading, Without a Certain "E"*, The New York Times, January 15, 2006.

that speculators have injected tens of billions of dollars into the energy commodities markets. Although the absence of data makes it impossible to precisely quantify the effect of these speculative investments on prices, it appears from the CFTC data, market data, and the comments of a number of well-respected analysts that this increased speculation has fundamentally altered the relationship between crude oil inventories and prices. The purchase of long-term futures by speculators has provided a financial incentive for oil purchasers to build inventories and store oil for future use; this has resulted in a market characterized both by large amounts of oil in inventory and high prices.

Whether the current level of speculation has provided needed liquidity, encouraged the building of inventories, or created a speculative bubble in energy prices is impossible to determine without additional data. It is clear that better tools are needed to understand how much is being spent, by whom, in which markets and instruments, and the effect of increasing speculation on the price and affordability of energy in the United States.

The importance of understanding the effect of speculation on market prices cannot be understated. Professor Robert Shiller, in his prescient book *Irrational Exuberance,* which warned that the U.S. stock market was in the midst of a speculative bubble just prior to the price collapse of 2000–2001, wrote as follows:

> The extraordinary recent levels of U.S. stock prices, and associated expectations that these levels will be sustained or surpassed in the near future, present some important questions. We need to know whether the current period of high stock market pricing is like the other historical periods of high pricing, that is, whether it will be followed by poor or negative performance in coming years. We need to know confidently whether the increase that brought us here is indeed a *speculative bubble*—an unsustainable increase in prices brought on by investors' buying behavior rather than by genuine, fundamental information about value. In short, we need to know if the value investors have imputed to the market is not really there, so that we can readjust our planning and thinking.[76]

In light of the vital importance of energy to our national economy and security, the need to better understand the role of speculation in price formation is just as important for the energy market as for the stock market.

3. Large Profits from Speculation in Energy Commodities

Accurate information about the profits and losses of market participants is difficult to obtain. Nonetheless, reports indicate that a number of firms, funds, and traders have reaped enormous profits from the recent increases in energy prices, energy price volatility, and trading volume. These large profits provide an indication of one of the incentives for speculation in today's energy commodity markets.

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[76] Robert J. Shiller, *Irrational Exuberance* (Princeton University Press, 2000), at p. 5.

For example, it has been reported that in 2004, Goldman Sachs and Morgan Stanley, the two leading energy trading firms in the United States, earned a total of about $2.6 billion in net revenues from commodities trading, mostly from energy commodities.[77] For 2005, Goldman Sachs and Morgan Stanley each reportedly earned about $1.5 billion in net revenue from energy transactions.[78]

A recent article in *Trader Monthly* magazine included short profiles of the "100 Highest Earning Traders" for 2005, as ranked by the magazine. Overall, *Trader Monthly* reported, "On Wall Street, some of the scores were gargantuan, as bulge-bracket banks enjoyed one of the most profitable years in the history of the markets, from asset-backed to credit and crude to crack spreads."[79] Although the rankings are based on estimates and anecdotal information, and the article does not explain how the profiled traders generated their income, it nonetheless provides some information regarding the magnitude of some of the earnings of leading energy commodity traders in 2005.[80] The *Trader Monthly* rankings group these traders into several categories: hedge fund managers, Wall Street Traders, and "the rest," which includes traders working for brokerage firms that own seats on the NYMEX.

At the top of the *Trader Monthly* list, T. Boone Pickens was reported to have earned between $1 and $1.5 billion in energy trading in 2005. The magazine reports that Mr. Pickens' main commodities fund earned a return of approximately 700 percent in 2005, which it "believes is the largest one-year sum ever earned."[81] Another hedge fund magazine, *Alpha,* estimated that Mr. Pickens' trading strategies earned $1.4 billion in 2005, largely due to his bets on crude oil.[82]

Following an interview with Mr. Pickens, the *Associated Press* reported, "Oil tycoon Boone Pickens' bet that energy prices would rise made him more money in the past 5 years than he earned in the preceding half century hunting for riches in petroleum deposits and companies."[83] During this interview, which occurred in mid-2005, when the price of oil was approaching a then-record $60 per barrel, Mr. Pickens stated, "I can't tell for sure where [prices are] going,

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[77] Alexei Barrionuevo, *Energy Trading, Without a Certain "E",* The New York Times, January 15, 2006.

[78] *Wall Street firms reshape power trading, add liquidity in physical and paper markets,* Platts Power Markets Week, January 16, 2006; *See also,* Ann Davis, *Morgan Stanley trades energy in barrels,* Pittsburgh post-gazette.com, March 3, 2005.

[79] Rich Blake and Andrew Barber with Robert LaFranco, *The Trader Monthly 100; Earn, Baby, Earn,* Trader Monthly, April/May 2006 (hereinafter cited as *"The Trader Monthly 100"*), at p. 69.

[80] The Subcommittee staff has not verified the information contained in the *Trader Monthly* article.

[81] *The Trader Monthly 100,*, at p. 71.

[82] Stephen Taub, *Really Big Bucks,* Alpha, May 2006, at p. 19. Mr. Pickens ranked second on the *Alpha* list. Mr. James Simons, who *Trader Monthly* ranked third with an estimated $900 million–$1 billion in earnings, was ranked first by *Alpha,* with an estimated $1.5 billion in earnings. The two rankings identify many of the same individuals as the top hedge fund traders, although the estimates of earnings vary by significant amounts—hundreds of millions of dollars in some instances. The *Alpha* rankings only list the top 25 traders; with the exception of Mr. Pickens, the energy traders identified in the *Trader Monthly* rankings did not earn enough to qualify for this list. *See also* Alistair Barr, *Hedge-fund giants Simon, Pickens made more than $1 bln in 2005,* MarketWatch, May 26, 2006, at http://www.marketwatch.com (last visited May 26, 2006).

[83] Brad Foss, *AP Interview; Riding high on oil prices, Boone Pickens sees prices going even higher,* Associated Press, June 22, 2005.

other than up."[84] Mr. Pickens' success in predicting price increases may have even created its own momentum for further price increases—according to *Natural Gas Week,* "[Mr. Pickens] regularly talks up crude oil and natural gas prices on financial market cable TV. Traders and futures brokers report that each time this happens, more speculative interest is drawn to energy futures markets."[85]

Also at the top of the list of energy traders is John Arnold, a former Enron trader who left Enron in 2002 to start his own hedge fund, Centaurus Energy, with three employees and $8 million of his own money.[86] As of January of this year, Centaurus employed 36 people and had about $1.5 billion in assets.[87] At a recent energy conference, Mr. Arnold said he "looks to place bets on a market that he determines is 'biased,'" meaning that the market is not reflecting the fair value for a product.[88] "We ask ourselves can we identify what is forcing a market to price a product at an unfair value, and then, what will push it back to fair value."[89] Mr. Arnold also stated how a significant amount of speculative trading was taking place on the unregulated over-the-counter Intercontinental Exchange (ICE). "'Trading never went away,' Arnold said, 'What has changed is the non-commercial type of interest.' Intercontinental Exchange, he said, has provided huge new opportunities, as has NYMEX's Clearport trading. 'Because of this, there has never been as much investor interest . . . as there is today.'"[90]

Table 1 lists the traders who *Trader Monthly* reported to have obtained a significant portion of their profits from trading energy commodities. Inclusion on this list is not meant to imply that any of the traders derived their profits from any improper trading activity.

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[84] *Id.* It was long before this 2005 interview, however, that Mr. Pickens began betting that the price of oil would rise, based on a belief that the rapid increase in demand had used up all of the global spare production capacity. In May 2004, for example, when oil was trading at about $40 per barrel, and most analysts were predicting prices would fall, Mr. Pickens publicly predicted prices would keep increasing: "I think you'll see $50 before you see $30 again." Darrell Preston, Bloomberg News, *T. Boone is Back; The Corporate Raider Who Brought Down Gulf Oil is Cashing in on Oil Price Spike,* Pittsburgh Post-Gazette, October 10, 2004. Opinions vary as to the reason Mr. Pickens has been so successful recently. "He understands the industry and business like no one else," commented billionaire Harold Simmons, one of the original investors in Mr. Pickens' hedge funds. *Id.* On the other hand, Peter Fusaro, chairman of Global Change Associates, a consulting firm, commented, "He just got lucky." *Id.*

[85] *Behind Runaway Prices: Supply Issues are Real, But Hype Sets Bar,* Natural Gas Week, September 5, 2005.

[86] See Barrionuevo, *Energy Trading, Without a Certain "E",* The New York Times, January 15 2006.

[87] *Id.*; *See also,* Peter Elkind, Bethany McLean, *The Luckiest People in Houston,* Fortune, April 17, 2006. Among those now working for Mr. Arnold is Greg Whalley, who, as head of wholesale trading at Enron, once was Mr. Arnold's boss. In August 2001, following the resignation of Jeffrey Skilling, Mr. Whalley was appointed Enron's president. *Id.*

[88] *Two former Enron trading experts share dais and ideas on energy market evolution,* Platts Power Markets Week, February 13, 2006.

[89] *Id.*

[90] *Id.*

Table 1
Selected Top Energy Traders in 2005

Trader	Firm Type of Trader	2005 Estimated Earnings	*Trader Monthly* Comments
T. Boone Pickens	BP Capital (hedge fund)	$1.5 billion +	"'Long Crude' doesn't even begin to describe T. Boone Pickens' position. With $5 billion and growing in assets under management, his fund company, BP Capital, is throwing off a small national economy via an unshakable bet that the world's oil supply can't keep up with demand. . . . Returns on Pickens' main commodities pool were over 700 percent in 2005 . . . [This] translates into what **Trader Monthly** believes is the largest one-year sum ever earned. . . ."
Brian Hunter	Amaranth Advisors (hedge fund)	$75–$100 million	"In 2005, Hunter was certainly among the top natural gas traders in the world. . . . Rumor is that Hunter made Amaranth an estimated $800 million off his book, mainly [natural] gas derivatives positions but also some other energy dabblings."
John Arnold	Centaurus Energy (hedge fund)	$75–$100 million	"Starting 4 years ago with $8 million of his own dough, John D. Arnold, former star Enron energy trader, has since amassed more than $1 billion in assets. Most of the 16 other traders at his Centaurus Energy fund operation came from Enron."
Jim Pulaski	Tudor Investment (hedge fund)	$50–$75 million	"[T]his Tudor energy trader is commander in chief when it comes to natural gas."
Steven Berkson	Trader (NYMEX)	$25–$30 million	"Readers of **Trader Monthly** will remember the legend of natural-gas-futures stalwart Steve Berkson and Hurricane Katrina One of the tallest versions of the tale has Berkson making $40 million off the opening bell the day Katrina made landfall (we heard he ended up tallying around $20 million for the week). Lesser known is how much of that score Berky ultimately slid to relief efforts (reportedly a sizable portion)."
Mark Fisher	MBF Clearing operator (NYMEX)	$25–$30 million	"Few people have more at stake in the future of the NYMEX than Fisher, who runs MBF Clearing, the primary market-making operation for the exchange's top-grossing crude-oil futures contract."
Simon Greenshields	Morgan Stanley	$20–$25 million	"Morgan Stanley's head of gas and power, Greenshields is part of the bank's elite energy crew. His specialties are natural gas and electricity. . . ."
Olav Refvik	Morgan Stanley	$20–$25 million	"Refvik is a key part of one of the most profitable energy-trading operations in the world. He has helped the bank dominate the heating oil market by locking up New Jersey storage-tank farms adjacent to New York Harbor. . . ."

Table 1—Continued
Selected Top Energy Traders in 2005

Trader	Firm Type of Trader	2005 Estimated Earnings	*Trader Monthly* Comments
John Shapiro	Morgan Stanley	$20–$25 million	"Shapiro has been a vital part of Morgan's energy effort, working [to help] oversee the 200-plus-person profit center."
John Bertuzzi	Goldman Sachs	$15–$20 million	"A star trader on one of the most powerful energy desks on earth. . . ."
George "Beau" Taylor	J.P Morgan	$15–$20 million	"[Taylor] . . . switched over to J.P. Morgan, where he now helps oversee the firm's 80-person energy-trading unit."
Jeffrey Wolfson	Trader (NYMEX)	$15–$20 million	"Crude oil traders don't come much bigger than the man whose badge reads GEOF. A one-man volume-generation machine. . . ."
Vincent Kaminski	Citigroup	$10–$15 million	"Kaminski is a revered energy trader considered among the foremost authorities on measuring and analyzing market risk. . . ."
Todd Applebaum	Trader (NYMEX)	$10–$15 million	"Applebaum is another natural gas guy who lit it up in 2005. 'Great trader, huge volume,' says one NYMEX insider."
Eric Bolling	Trader (NYMEX)	$10–$15 million	"Among the most famous natural gas traders on the floor today . . . [Bolling] is said to account for as much as 5 percent of total volume in [natural gas]. . . ."
Sandy Goldfarb	Trader (NYMEX)	$10–$15 million	". . . [Goldfarb] knocked his [natural gas] book out of the ozone layer last year amid one hurricane after another and some of the most treacherous volatility ever recorded in the decade and a half since natural gas futures were created. . . ."
Robert Halper	Trader (NYMEX)	$10–$15 million	"When it comes to [arbitraging] crude oil against gasoline, Bob Halper wrote the book. According to some, he will go down as one of the biggest crack-spread traders the NYMEX has ever seen."
Daniel Lirtzman	Trader (NYMEX)	$10–$15 million	"A natural gas 'natural.'. . ."
Kevin McDonnell	Trader (NYMEX)	$10–$15 million	"Chalk up yet another blowout year. . . ."
Simon Posen	Trader (NYMEX)	$10–$15 million	"Last year's natural gas swings produced a significant surge in Posen's trading profits."
Mitchell Stern	Trader (NYMEX)	$10–$15 million	"Stern had a huge year, sources say."

Table 1. Large trader profits are an indicator of increased speculation in energy commodity markets. Data source: *Trader Monthly,* April/May 2006.

Not only are the top traders for investment banks and funds earning record incomes, but in-house corporate traders are earning record amounts as well. According to a recent article in *Bloomberg* news, at Sempra Energy, the owner of the biggest U.S. natural gas utility, "as many as 30 commodity traders [make] more than the $2 million earned last year by Chief Executive Officer Don Felsinger. 'That's what it costs to be in this business,' Felsinger

[said] in a May 17 interview."[91] *Bloomberg* also reported that division managers for commodities trading were also the most highly paid employees at Constellation Energy, earning approximately $5 million in bonuses, compared to a total compensation package of about $4 million for the chief executive officer.[92]

IV. NO COP ON THE BEAT FOR OVER-THE-COUNTER ENERGY MARKETS

Until recently, the trading of U.S. energy futures was conducted exclusively on regulated exchanges within the United States, like the NYMEX, and subject to extensive oversight by the CFTC and the exchanges themselves in order to detect and prevent price manipulation. Under the Commodity Exchange Act, the purpose of CFTC regulation is to deter and prevent price manipulation, ensure the "financial integrity" of transactions, maintain market integrity, prevent fraud, and promote fair competition.[93] This regulation and the resulting transparency has bolstered investor confidence in the integrity of the regulated U.S. commodity markets and helped propel U.S. exchanges into the leading marketplace for many commodities.

Pursuant to its statutory mandate to detect and prevent price manipulation, the CFTC has imposed a variety of reporting requirements and regulations on the trading of commodity futures and options. NYMEX traders, for example, are required to keep records of all trades and report large trades to the CFTC. The CFTC uses these Large Trader Reports, together with daily trading data providing price and volume information, to monitor exchange activity and detect unusual price movements or trading.

None of this oversight to prevent price manipulation, however, applies to any of the energy trading conducted on OTC electronic exchanges. As a result of a provision inserted by House and Senate negotiators during the waning hours of the 106th Congress into legislation that became the Commodity Futures Modernization Act of 2000 (CFMA),[94] the Commodity Exchange Act exempts from CFTC oversight all trading of energy commodities by large firms on OTC electronic exchanges.[95]

In recent years, there has been a tremendous growth in the trading of energy commodity contracts that are virtually identical to fu-

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[91] *What's a Top Commodity Trader Worth? Quintuple 2000 Salaries,* Bloomberg.com, June 1, 2006.

[92] *Id.*

[93] 7 U.S.C. § 5.

[94] The provisions of the CFMA that provide exclusions and exemptions for energy and metal commodities were included in the version of the legislation that passed the House on October 19, 2000 (H.R. 4541, 106th Cong., 2nd Sess.), but were omitted from the version placed on the Senate calendar after passage by the Senate Committee on Agriculture in late August (S. Rept. 106–390). Following negotiations between members of the House and Senate Agriculture committees, the legislation that became the Commodity Futures Modernization Act—with the exclusions for energy and metal commodities—was introduced in the House on December 14 and in the Senate on December 15, 2000. The CFMA was passed by both the House and Senate on December 15, the last day of the 106th Congress, as part of an omnibus legislative package involving 13 appropriations bills and several authorization bills. There was no opportunity for debate on any of the specific provisions in the CFMA; the Senate passed this entire omnibus package by unanimous consent. A history of the regulation of the trading of energy commodities is presented in Appendix 2 of the Report prepared by the Minority Staff of the Permanent Subcommittee on Investigations, *U.S. Strategic Petroleum Reserve: Recent Policy Has Increased Costs to Consumers But Not Overall U.S. Energy Security,* S. Prt. 108–18, 108th Cong., 1st Sess. (March 5, 2003).

[95] 7 U.S.C. § 2(h)(3).

tures contracts, but which are traded on OTC electronic exchanges rather than the regulated futures exchanges. These contracts are so similar to futures contracts that they are often called "futures look-alike contracts." Although the trading of futures contracts on futures markets is subject to extensive oversight, as a result of the CFMA exemptions the trading of futures look-alikes on an OTC electronic exchange is not subject to any CFTC oversight. The growth of these OTC electronic markets, therefore, has been creating an increasing "blind spot" in the CFTC's oversight of the trading of energy commodity futures. This increasing blind spot significantly impairs the CFTC's ability to carry out its statutory mandate to detect and prevent price manipulation.

A. Development of OTC Electronic Markets

"Enron did two things for us. It validated our model, and in 2000, 13 big market makers agreed to support the ICE's efforts."

—Jeffrey Sprecher, Chairman and CEO, Intercontinental Exchange[96]

Initially, the OTC market was not an actual place or facility where trading occurred, but rather a general term that referred to instances in which two parties would come together to reach agreement on a contract between them to protect against or assume price risks that could not be adequately addressed by the trading of standardized futures contracts on the regulated futures exchanges. Until the advent of electronic trading in the late 1990s, the terms of most OTC contracts were customized through negotiations between the two parties, either face-to-face or through brokers over the telephone. Because the terms of these customized, bilateral deals were unique, and the contracts generally could not be traded or assigned to third parties, these OTC contracts were considered simply as bilateral contracts, outside the CFTC's jurisdiction.

In the 1990s, as energy deregulation gained momentum, and energy was increasingly being considered as another commodity priced on an open market, energy producers and suppliers desired additional protections against market price risks. OTC contracts became more popular, and the increasing number of energy providers, merchants and traders holding these contracts desired to trade these OTC instruments to third parties to help reduce, diversify or spread the risks they had assumed. In response, the OTC market began to develop standardized OTC contracts that could be traded to multiple parties. Following rapid developments in computer and internet technology in the 1990s, a number of companies and groups developed electronic exchanges to facilitate these OTC trades.[97]

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[96] Gerelyn Terzo, *A Battle Royal; A sleek upstart and an entrenched giant are waging all-out war for the soul of the energy trading market,* Investment Dealers Digest, May 1, 2006.

[97] Initially, the most prominent of these electronic exchanges was operated by Enron. On Enron's electronic trading platform, called "Enron OnLine," Enron became the counterparty to all of the trades. Enron's position as a party to all trades provided Enron with superior market information and created a non-level playing field. Following Enron's collapse and the subsequent revelations of how Enron abused its superior knowledge and market position, *see, e.g.,* note 117, the Enron "one to many" trading model was discredited. Today, all of the electronic exchanges are "many to many" exchanges, meaning that the parties trade with each other rather than the operator of the exchange.

In 2000, a half dozen investment banks and oil companies formed the Intercontinental Exchange (ICE) for OTC electronic trading in energy and metals commodities.[98] The Atlanta-based ICE is an electronic exchange open only to large commercial traders that meet the definition of an "eligible commercial entity" under the Commodity Exchange Act.[99] According to ICE, its market participants "must satisfy certain asset-holding and other criteria and include[] entities that, in connection with their business, incur risks relating to a particular commodity or have a demonstrable ability to make or take delivery of that commodity, as well as financial institutions that provide risk-management or hedging services to those entities." [100]

Today, ICE operates the leading OTC electronic exchange for energy commodities. ICE describes its participants as "some of the world's largest energy companies, financial institutions and other active contributors to trading volume in global commodity markets. They include oil and gas producers and refiners, power stations and utilities, chemical companies, transportation companies, banks, hedge funds and other energy industry participants." [101] According to ICE, its electronic markets now constitute "a significant global presence with over 9,300 active screens at over 1,000 OTC participant firms and over 440 futures participant firms as of December 31, 2005." [102]

Unlike NYMEX, ICE does not require its participants to become formal members of its exchange or to join a clearinghouse.[103] Any large commercial company qualifying as an eligible commercial entity can trade through ICE's OTC electronic exchange without having to employ a broker or pay a fee to a member of the Exchange.

Although ICE's OTC exchange does not operate its own clearinghouse, ICE has contracted with a third party, the LCH.Clearnet, to offer clearing services for traders who desire to trade only with other cleared traders. By trading only with other cleared traders, a party trading on ICE can eliminate the risk of default by the

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[98] The founding partners of ICE are BP Amoco, Deutsche Bank AG, Goldman Sachs, Dean Witter, Royal Dutch/Shell Group, SG Investment Bank, and Totalfina Elf Group. In November 2005, ICE became a publicly traded corporation. Many of these original founders are major shareholders: Morgan Stanley owns nearly 15 percent of ICE shares, Goldman Sachs owns about 14 percent, Total owns about 9.5 percent, and BP owns about 9 percent. *Market Forces: Big Oil increases market reach,* Energy Compass, March 24, 2006.

[99] Participation is restricted to parties that quality as an "eligible commercial entity" under Section 1a(11) of the CEA. Generally, these entities are large financial institutions, insurance companies, investment companies, corporations and individuals with significant assets, employee benefit plans, government agencies, and registered securities brokers and futures commission merchants.

[100] Intercontinental Exchange Inc, Form 10–K, filed March 10, 2006 ("ICE 10–K"), at p. 14. There does not appear to be any mechanism to ensure that only eligible commercial entities actually trade on ICE. The CFTC does not monitor or oversee participation; ICE declined to answer the Subcommittee staff's questions as to whether or how it monitors trader qualifications.

[101] ICE 10–K, at p. 14.

[102] ICE 10–K, at p. 6. As explained in Section V, in 2001, ICE purchased the International Petroleum Exchange, a London-based futures exchange that traded North Sea Brent crude oil and natural gas delivered in Europe. In 2005, ICE renamed the London exchange as "ICE Futures" and converted its open-outcry pit trading system into an all-electronic exchange. Hence, ICE now operates two major electronic markets: ICE Futures and ICE OTC. ICE Futures is a futures market in London, regulated by the U.K. Financial Services Authority, and ICE OTC operates as an "exempt commercial market" under Section 2(h)(3) of the U.S. Commodity Exchange Act. Both markets operate outside of the CFTC's oversight.

[103] In contrast, on NYMEX and other regulated futures exchanges, the exchange clearinghouse acts as the buyer for all sellers and the seller for all buyers. Persons that are not members of the exchange must trade through a clearing member. Clearing members accept all financial responsibility for the trades they conduct on behalf of the customer initiating the trade.

other party just as if he or she were trading on a futures exchange, thereby avoiding one of the traditional disadvantages of OTC trading.[104] ICE describes the advantages of OTC trading through a clearinghouse:

> The use of OTC clearing serves to reduce the credit risk associated with bilateral OTC trading by interposing an independent clearinghouse as a counterparty to trades in these contracts. The use of a central clearinghouse rather than the reliance on bilateral trading agreements [has] resulted in more participants becoming active in the OTC markets. In addition, clearing through a central clearinghouse typically offers market participants the ability to reduce the amount of capital required to trade as well as the ability to cross-margin positions in various commodities.[105]

ICE claims that its OTC markets "offer trading in hundreds of natural gas, power and refined oil products on a bilateral basis. At the end of first quarter 2006, we also offered over 50 cleared OTC contracts, which account for the majority of our commission revenue. In March 2006, we began the introduction of more than 50 planned additional cleared OTC contracts, with the first 34 cleared contracts launched through the end of April this year."[106] According to ICE, its natural gas contracts are its most heavily traded contracts. ICE states it traded nearly 43 million cleared OTC Henry Hub natural gas contracts in 2005, "compared to 10.4 million cleared OTC Henry Hub natural gas contracts traded by our nearest competitor during the same period."[107]

ICE claims that its "introduction of cleared OTC products has enabled us to attract significant liquidity in the OTC markets we operate."[108] Others agree. "[C]learing is paving the way for greater growth of the energy market as a whole," one futures industry publication reported. "Clearing not only helped restore liquidity post-Enron, it opened the door to an influx of hedge funds and other professional traders, many of whom come from the financial world." Moreover, OTC clearing has "created a new linkage" between the futures markets and the OTC markets. "On one level this is simple

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[104] NYMEX also offers an electronic trading platform for the trading of standardized OTC instruments, and provides clearinghouse services, called "NYMEX ClearPort," for traders using the NYMEX OTC electronic trading platform. NYMEX states that its OTC clearing service "lets market participants take advantage of the financial depth and security of the Exchange clearinghouse along with round-the-clock access to more than 60 energy futures contracts including natural gas location differentials; electricity, crude oil spreads and outright transactions; refined product crack and location spreads and outright transactions; and coal." NYMEX, NYMEX ClearPort Services, on NYMEX website, at http://www.nymex.com/cp—overview.aspx (last visited May 19, 2006).

[105] Intercontinental Exchange Inc., Form 10–Q, filed May 2, 2006 ("ICE 10–Q"), at p. 16. In 2005, ICE also contracted with North American Energy Credit and Clearing, LLC, to provide clearing for trades in physically-settled OTC natural gas and power contracts. *Id.*

[106] ICE 10–Q, at p. 17.

[107] ICE 10–K, at p. 5.

[108] ICE 10–K, at p. 5. ICE states, "both physically-delivered and cash-settled gas products can be traded at a fixed price or differential to recognized published indices." ICE website, at https://www.theice.com/naturalgas.jhtml. *See also, e.g.*, ICE, OTC Natural Gas Clearing and Credit, Product Specifications, March 24, 2006; ICE, OTC Natural Gas and Financial Power Clearing and Credit, Product Specifications for products to be launched on April 7, 2006. ICE further amplifies: "A substantial portion of the trading volume in our OTC markets relates to approximately 15-20 highly liquid contracts in natural gas, power, and oil. For these contracts, the highest degree of market liquidity resides in the prompt, or front month, whereas that liquidity is reduced for contracts with settlement dates further out, or in the back months." ICE 10–K, at p. 9.

arbitrage between two sets of similar contracts. On another level it is a cross-fertilization of people and ideas, as each side seeks out better opportunities in newly accessible markets."[109] "If you want to participate in all the information of the market," said Bo Collins, former President of NYMEX, and now the operator of his own hedge fund, "you have to participate electronically and OTC."[110]

Today, there are few, if any, practical differences between the energy commodities traded on the regulated futures markets and the standardized, cleared contracts traded on the unregulated OTC electronic exchanges. From an economic perspective, there is no distinction between trading a standardized, cleared OTC contract for future delivery on ICE and trading a standardized, cleared futures contract on NYMEX.[111] Both types of contracts allow buyers and sellers to hedge against price risks and to speculate on price changes. In each market counterparty risk is eliminated by use of a clearinghouse. In each market, contracts are put on the market and bought and sold many times.

From a practical perspective, the only real difference between the two markets is the degree of regulation. ICE distinguishes its OTC market from the regulated futures exchanges primarily by the absence of regulation.[112] Trading on the futures market is subject to CFTC oversight, while trading on the unregulated OTC exchanges is not.

B. No Oversight of OTC Electronic Markets

Section 2(h)(3) of the Commodity Exchange Act, which became law as part of the CFMA, exempts from CFTC oversight all agreements, contracts, and transactions in energy and metals ("exempt commodities") that are traded on electronic trading facilities between "eligible commercial entities."[113] Generally, an eligible commercial entity must be either a large financial institution, insurance company, investment company, corporation or individuals with significant assets, employee benefit plan, government agency, registered securities broker, or futures commission merchant. Markets operating under Section 2(h)(3) are referred to as "exempt commercial markets."[114]

An exempt commercial market (ECM) is subject to the CEA's statutory prohibitions on fraud and price manipulation and, if the CFTC determines that the market performs a significant price discovery function, the ECM must provide pricing information to the public, but otherwise it is fully exempt from the CFTC's regulatory oversight. The CFTC describes its authority over these ECMs as follows:

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[109] Will Acworth, *The Tipping Point: OTC Energy Clearing Takes Off,* Futures Industry Magazine, January/February 2005.

[110] *Id.* Although NYMEX's ClearPort offers a similar OTC trading opportunities, ICE currently has approximately 80 percent of the market for cleared OTC Henry Hub natural gas contracts and 85 percent of the cleared OTC PJM financial power contracts. ICE 10–Q, at p. 28.

[111] Generally, futures contracts for key energy commodities can be settled through physical delivery of the commodity, whereas OTC futures look-alikes are financially settled. Since only a small percentage of futures contracts actually result in physical delivery of the commodity, this distinction does not make a practical difference in the economic function or utility of the two types of contracts. Moreover, many of the financially-settled OTC contracts reference the NYMEX price for settlement; in this respect the two markets are intertwined.

[112] ICE 10–K, at p. 25.

[113] 7 U.S.C. Sec. 2(h)(3).

[114] 7 U.S.C. Sec. 1a(11).

> In contrast to its authority over designated contract markets and registered derivatives transaction facilities, the CFTC does not have general oversight authority over exempt commercial markets. Exempt commercial markets are not registered with, or designated, recognized, licensed or approved by the CFTC.[115]

Today, the CFTC does not apply to exempt commercial markets like ICE any of the oversight and surveillance measures it currently uses to oversee regulated futures markets like the NYMEX. Table 2 provides a comparison of the oversight mechanisms used to police trading on the two markets and prevent price manipulation and fraud.

Table 2

Futures and Exempt Commercial Markets: Differences in Oversight to Prevent Price Manipulation

Measure to Prevent Price Manipulation	Does the Measure Apply to the:	
	Futures Market	Exempt Commercial Market
CFTC Market Surveillance Program		
• CFTC staff monitoring of daily trading reports	Yes	No
• Weekly reports and reviews for expiring contracts	Yes	No
• Option of special data call by CFTC	Yes	Yes
Large Trader Reporting		
• Large trader reporting by clearing members	Yes	No
• Large trader reporting by exchanges	Yes	No
• Filing of information about trading accounts by traders	Yes	No
Core Principles for Exchange Operations		
• Exchange is responsible for monitoring compliance with market rules	Yes	No
• Exchange can only list contracts for trading that are not readily susceptible to manipulation	Yes	No
• Exchange must monitor trading to prevent manipulation, price distortion, and disruption of the delivery or cash-settlement process	Yes	No
• Position limits for speculators to reduce the potential threat of manipulation or congestion	Yes	No
• Emergency authority, in consultation with the CFTC, to liquidate positions, suspend trading, or impose special margin requirements	Yes	No
• Daily submission of trading information to CFTC	Yes	Limited
• Daily publication of trading information	Yes	*
• Exchange must keep records of trading	Yes	Yes

* Section 2(h)(4) of the Commodity Exchange Act requires daily publication of trading information if the market performs a price discovery function. The CFTC has not made any determination as to whether any of the exempt commercial markets performs a price discovery function. *See* Section IV.D in this report.

[115] Cite to Section 2(h)(3). CFTC, *Exempt Commercial Markets That Have File Notice with the CFTC,* at CFTC website at http://www.cftc.gov/dea/dea—ecm—table.htm (last visited May 19, 2006).

These differences are substantial. For example, unlike the regulated exchanges, on OTC electronic exchanges, neither the CFTC nor the OTC trading facility itself monitors trading activity to detect and deter fraud and price manipulation. Key trading information is not disclosed to the CFTC or the public. Although ICE discloses to the CFTC and subscribers of its data services certain information about posted bids, offers, and completed trades, other critical data routinely reported by the regulated exchanges to the CFTC and the public, such as open interest, is not reported by ICE. Large trader reports do not have to be filed with the CFTC. Unlike trading on the NYMEX, there are no position limits or price change limits.

The most frequently asserted justification for this disparity in regulatory coverage is that only large institutions that are sophisticated traders with less need for governmental protection are permitted to trade on these electronic trading facilities. But federal regulation of commodity markets is not designed solely to protect commodity traders; it is also intended to protect commodity purchasers and the public at large, including consumers who ultimately bear the costs of energy products such as gasoline, heating oil, diesel fuel, and natural gas.

The Commodity Exchange Act articulates the national interest in preventing price manipulation and excessive speculation:

> The transactions and prices of commodities on such boards of trades are susceptible to excessive speculation and can be manipulated, controlled, cornered or squeezed to the detriment of the producer or the consumer and the persons handling commodities and the products and by-products thereof in interstate commerce, rendering regulation imperative for the protection of such commerce and the national public interest therein.[116]

The history of commodity markets demonstrates it is unrealistic to rely on the self-interest of a few large traders as a substitute for dedicated, independent oversight to protect the public interest. Commodity traders have no responsibility or obligation to look out for public rather than private interests. In some cases, it could be a breach of fiduciary duty for officers of a private corporation to look out for interests other than those of the corporation's shareholders. Most recently, the Enron scandal, which involved misconduct by a number of traders at large energy and trading companies active in OTC trading, is clear evidence of how a few sophisticated, unscrupulous traders can harm not only other market participants, but also the public at large by artificially increasing prices.[117] Consumers paying artificially high energy prices suffer

[116] 7 U.S.C. § 5. This statement of purpose in the CEA was revised to read in its current form as part of the CFMA of 2000.

[117] *See, e.g.,* August 2002 report prepared by the Federal Energy Regulatory Commission (FERC) staff, Docket No. PA–02–000, which found significant evidence of price manipulation and deceptive practices by Enron in connection with its OTC electronic trading platform, known as Enron OnLine. The report includes a detailed analysis of natural gas trades made on Enron OnLine for next-day delivery into California over the course of a single day, January 31, 2001. The report found that of a total of 227 trades on that day, 174 involved Enron and a single unnamed party; these 174 trades took place primarily during the last hour of trading, and by using "higher prices," these trades resulted in a steep price increase over the last hour of trading. The report also noted that price information displayed electronically on Enron OnLine was a "significant, even dominant" source of price information used by reporting firms publishing

the same harm regardless of whether the price was manipulated on an OTC electronic exchange or on a regulated futures market.

C. No Large Trader Reporting in OTC Electronic Markets

As indicated in Table 2, Large Trader Reports are not required in OTC electronic markets. The absence of information about large trades increases the vulnerability of these markets to price manipulation and excessive speculation.

CFTC Chairman Reuben Jeffery III, recently stated, "One of the core themes of the Commodity Exchange Act . . . is that the commodity markets operate free of manipulation and the Commission's most basic responsibility is to detect and deter such behavior so that markets operate in an open and competitive manner, free of price distortions."[118] To fulfill this responsibility, the Commission has established a market surveillance program, whose primary mission is "to identify situations that could pose a threat of manipulation and to initiate appropriate preventive actions."[119] "[T]he Commission attempts to proactively combat potential manipulation," Chairman Jeffery explains, "rather than simply waiting until someone has attempted to manipulate prices."[120] The CFTC staff monitors the daily trading on the regulated exchanges, with particular focus on "the daily activities of large traders, key price relationships, and relevant supply and demand factors."[121]

The "cornerstone" of the surveillance program is the Commission's Large Trader Reporting (LTR) system.[122] Chairman Jeffery states the LTR system "enables detection of concentrated and coordinated positions that might be used by one or more traders to attempt manipulation. This transparency is also well known to market participants, providing yet another element of deterrence."[123] The CFTC's Chief Economist, Dr. James Overdahl, recently told Congress that the LTR system "is a powerful tool for detecting the types of concentrated and coordinated positions required by a trader or group of traders attempting to manipulate the market."[124]

Under the LTR system, clearing members of futures exchanges (the entities that actually do the trading on behalf of customers) must file daily reports with the CFTC identifying the futures and options positions held by its customers above specific threshholds established by the Commission. To enable the CFTC to aggregate trader positions that may have been established through more than one clearing member, traders themselves are required to inform the CFTC of each account that acquires a reportable position.

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natural gas pricing data. The report tentatively concluded that Enron OnLine price data was susceptible to price manipulation and may have affected not only Enron trades, but also increased natural gas prices industrywide.

[118] Letter from Reuben Jeffery III, Chairman, Commodity Futures Trading Commission, to Governor Jennifer Granholm, August 22, 2005.

[119] CFTC Backgrounder, *The CFTC Market Surveillance Program*, June 2001, at CFTC website, at http://www.cftc.gov/opa/backgrounder/opasurveill.htm?from=home&page=mktsurveil-content.

[120] Letter from Reuben Jeffery III, Chairman, Commodity Futures Trading Commission, to Governor Jennifer Granholm, August 22, 2005.

[121] CFTC, *The CFTC Market Surveillance Program.*

[122] Letter from Reuben Jeffery III, Chairman, Commodity Futures Trading Commission, to Governor Jennifer Granholm, August 22, 2005.

[123] *Id.*

[124] Statement of Dr. James Overdahl, *Global Oil Demand/Gasoline Prices*, Hearing before the Senate Committee on Energy and Natural Resources, September 6, 2005.

"Only by properly identifying and aggregating accounts can the surveillance staff make a thorough assessment of a trader's potential market impact and a trader's compliance with speculative position limits."[125] The exchanges themselves are required to report similar data to the CFTC. According to the CFTC, "The aggregate of all large-traders" positions reported to the Commission usually represents 70 to 90 percent of the total open interest in any given market."[126]

The Commission describes how it uses this data to take appropriate action to detect and deter price manipulation:

> Surveillance economists prepare weekly summary reports for futures and options contracts that are approaching their critical expiration periods. Regional surveillance supervisors immediately review these reports. Surveillance staff advise the Commission and senior staff of potential problems and significant market developments at weekly surveillance meetings so that they will be prepared to take prompt action when necessary.[127]

The LTR system also provides critical information for the weekly Commitment of Traders Reports that the CFTC provides to the public. The CFTC's Chief Economist stated, "Data from the CFTC's Large Trader Reporting System can help answer questions about the role of non-commercial traders in U.S. energy futures markets." This data can be used to help determine the relative participation of commercial participants (firms that buy or sell the traded commodity as part of their business and use the futures markets for hedging) and of speculators (who are not using the market for hedging physical commodities). Without a Large Trader Reporting system, it is impossible to determine the composition of the futures markets and analyze the influence of speculation on market prices.[128]

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[125] CFTC Backgrounder, *The CFTC's Large-Trader Reporting System,* at CFTC website, at http://www.cftc.gov/opa/backgrounder/opa-ltrs.htm.

[126] *Id.*

[127] CFTC, *The CFTC Market Surveillance Program.*

[128] There are anecdotal reports that some traders prefer trading on the OTC energy markets in the United States because of the lack of regulation. *Natural Gas Week* recently quoted one trader:

> When volumes all of a sudden begin to increase in one market and begin to erode in another, you have to ask yourself where the real market is? Since there's not the same sort of mandatory reporting requirements in the OTC world, it's very likely the funds have had their fill of being scrutinized and spot-lighted as the culprits, so they are moving into another market area that is not so easily tracked and doesn't have as much attention drawn to it.

Funds Increasing OTC Volumes, Sidestepping Nymex Oversight, Natural Gas Week, April 25, 2005. *Natural Gas Week* also reported that hedge funds "benefit from the OTC traded futures market because they are not as transparent as NYMEX traded futures, and the non-commercial reporting requirements such as the CFTC mandated Commitment of Traders Report is not as stringent." *Id.* The article explained how speculators can influence the futures markets through their activity in the OTC market, or vice versa, and capture a profit through the difference in price between the two markets that may result from trading in one of the markets.

> "Last week, there was a lot of arbitrage going on between the OTC gas futures markets and the NYMEX futures markets, because at times the OTC markets were as much as 5 cents in back of the futures screen," another gas futures trader said. "The OTC futures markets usually trade nearly in tandem with the NYMEX futures screen, but it's not uncommon to be able to capture a spread between the two markets. Still, it's amazing that the speculative entities in the OTC market can move the NYMEX down by 5 cents or more in about 30 seconds. But they could just as easily position themselves in the OTC market to influence the NYMEX futures market to the upside as well," the trader added.

D. No Public Dissemination of Trading Data by OTC Electronic Markets

Under the Commodity Exchange Act, regulated markets are required to publish daily information about settlement prices, volume, open interest, and opening and closing price ranges for all actively traded contracts.[129] Under the Commodity Futures Modernization Act, OTC electronic markets must publish similar information if the CFTC determines that the market "performs a significant price discovery function" for the underlying cash market.[130] Although there is substantial evidence that the ICE OTC electronic exchange performs such a price discovery function, the CFTC has not undertaken any effort to make this determination. The failure to even attempt to make this determination ignores the Congressional mandate expressed in the law that the OTC electronic exchanges that perform a price discovery function be as transparent to the public as the regulated futures exchanges.

In 2004, the CFTC issued a rule setting forth the process and criteria it would use to determine whether an electronic exchange performed a price discovery function.[131] However, the CFTC has not taken any action in the 2 years since that rule was issued to actually determine whether ICE or any other OTC electronic market meets these criteria. Under the 2004 rule, an ECM performs a price discovery function when it meets one of two specified criteria:

> (A) Cash market bids, offers or transactions are directly based on, or quoted at a differential to, the prices generated on the market on a more than occasional basis; or
>
> (B) The market's prices are routinely disseminated in a widely distributed industry publication and are routinely consulted by industry participants in pricing cash market transactions.[132]

An ECM operating under the Section 2(h)(3) exemption must notify the CFTC when "it has reason to believe" either of these criteria are met, or if the "market holds itself out to the public as performing a price discovery function for the cash market for the commodity."[133]

If an ECM notifies the CFTC that it has reason to believe that it meets any of these criteria for performing a price discovery function, or the CFTC itself determines that an ECM appears to meet one of these criterion, then the CFTC must provide the ECM "with an opportunity for a hearing through the submission of written

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Id. The article also noted that funds can take large positions in the OTC market without having to report those positions to any regulatory agency, thereby circumventing any position limits that apply to their trading on the futures market.

[129] 7 U.S.C. Sec. 7(d).

[130] Under the CEA, electronic trading facilities that trade energy commodities are subject to "such rules and regulations as the Commission may prescribe if necessary to ensure timely dissemination by the electronic trading facility of price, trading, volume, and other trading data to the extent appropriate, if the Commission determines that the electronic trading facility performs a significant price discovery function for transactions in the cash market for the commodity underlying any agreement, contract, or transaction executed or traded on the electronic trading facility." 7 U.S.C. Sec. 2(h)(4)(D).

[131] 69 Fed. Reg. 43285 (July 20, 2004).

[132] 17 C.F.R. § 36.3(c)(2).

[133] 17 C.F.R. § 36.3(c)(2)(C).

data, views and arguments."[134] After conducting such a hearing, and "consideration of all relevant matters," the Commission "shall issue an order containing its determination whether the electronic trading facility performs a significant price discovery function" under this section.[135]

If the CFTC determines that an electronic trading facility performs a significant price discovery function, then the regulations require the facility to disseminate to the public, on a daily basis, the following information:

> (1) Contract terms and conditions, or a product description, and trading conventions, mechanisms and practices;
> (2) Trading volume by commodity and, if available, open interest; [and]
> (3) The opening and closing prices or price ranges, the daily high and low prices, a volume-weighted price . . . or such other daily price information as proposed by the facility and approved by the Commission.[136]

Despite the 2004 regulations, to date, neither ICE—nor any other ECM—has informed the CFTC that it has reason to believe that its electronic exchange performs a price discovery function. Yet at the same time, ICE appears to have made that very claim to the Securities and Exchange Commission (SEC). In the Form 10–K that ICE filed with the SEC on March 10, 2006, ICE identified price discovery as a core function of its over-the-counter markets: "Our participants, representing many of the world's largest energy companies, leading financial institutions and proprietary trading firms, as well as natural gas distribution companies and utilities, rely on our platform for price discovery, hedging and risk management."[137]

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[134] 17 C.F.R. § 36.3(c)(2)(C)(iii).

[135] *Id.*

[136] 17 C.F.R. § 36.3(c)(2)(C)(iv)(A). The information must be publicly disseminated no later than the business day following the day to which the information applies. *Id.* at Section 36.3(c)(2)(C)(iv)(B).

The 2004 rule also requires an exempt commercial market to inform the CFTC of those commodity contracts it is trading in reliance on the exemption set forth in Section 2(h)(3). *Id.* at Sec. 36.3(b)(1)(ii). The ECM must provide the CFTC with a description of the contract and weekly reports on the price, quantity, and other information the CFTC determines is appropriate for each trade in that commodity contract during the previous week. The facility may either provide this information in weekly reports or provide the CFTC with electronic access to the same information. *Id.* at Section 36.3(b)(1)(ii)(A) and (B). Additionally, the ECM must maintain records of complaints or allegations of fraud or manipulation, and forward any such complaints to the CFTC. *Id.* at Section 36.3(b)(1)(iii) and (iv). There is no requirement that the CFTC or an ECM provide this data to the public.

In comments filed on the proposed rule, ICE contended that the CFMA did not give the CFTC authority to conduct regulatory oversight of trading on electronic trading facilities or to require electronic trading facilities to submit reports. The CFTC rejected this argument, noting that Congress expressly stated ECMs were still subject to the anti-fraud and anti-manipulation provisions of the CEA. "If the Commission is to have the ability to enforce those provisions, it must have access to meaningful information concerning transactions on ECMs." 69 Fed. Reg. 43287. The CFTC also dismissed the contention that allowing the CFTC staff to monitor trading through the installation of a view-only trading screen at the CFTC was sufficient to enable the CFTC to monitor those markets for fraud and manipulation. "The Commission has found that the information provided under the current electronic access option is neither as relevant, nor as useful, as anticipated." *Id.* 69 Fed. Reg. 43286. It stated that the view-only access to computer screens provided to the CFTC by ICE "is not, in fact, equivalent to the large trader information received with respect to designated contract markets." *Id.* The CFTC, however, has not used this section to require information on open interest or large trades. Hence, the information that is provided to the CFTC under this section does not serve to provide the CFTC with the type of large trader information necessary to detect and prevent manipulation.

[137] ICE 10–K, at p. 4.

ICE's 10–K filing also describes its sale of a daily report containing price data about OTC transactions as a core business activity. ICE described its "OTC End of Day Report" as follows:

> The OTC ICE Data end of day report is a comprehensive electronic summary of trading activity in our OTC markets. The report is published daily at 3:00 p.m. Eastern time and features indicative price statistics, such as last price, high price, low price, total volume-weighted average price, best bid, best offer, closing bid and closing offer, for all natural gas and power contracts that are traded or quoted on our platform. The end of day report also provides a summary of every transaction, which includes the price [and] the time stamp. . . .[138]

It is not apparent why traders and energy firms would pay for ICE Data's End of Day Trader Reports if those reports did not provide valuable information about the data that is most useful to market participants—prices. Such price reports would appear to be useless or not worth the cost if the ICE trades did not perform a price discovery function. By generating valuable daily price data to industry participants, trading on ICE now performs a price discovery function.

It is difficult to reconcile ICE's daily trading reports and its statements to the SEC with its failure to notify the CFTC that its natural gas and electricity markets perform a price discovery function. As ICE states, most of the natural gas and power contracts traded in its OTC markets relate to "the prompt, or front month,"—meaning the futures contract that is closest to the spot or cash market. Hence, the prices of these contracts as traded on ICE have a direct influence on the prices of these commodities in the cash market.

Although the CFTC's 2004 rulemaking requires an ECM that has reason to believe it is performing a price discovery function to notify the CFTC, the CFTC has retained authority to initiate a hearing to determine whether an ECM meets the criteria for performing a price discovery function. Despite numerous unqualified statements by ICE on its website,[139] in press releases,[140] and in

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[138] ICE 10–K, at p. 13.

[139] *See, e.g.,* ICE. The Energy Marketplace, at https://www.theice.com/profile.jhtml (last visited June 9, 2006) ("IntercontinentalExchange is the world's leading electronic marketplace for energy trading and price discovery. . . . ICE's electronic trading platform offers direct, centralized access to trade execution and real-time price discovery through over 7,000 active screens at more than 1000 OTC and futures participant firms."); A Global Community of Energy Market Participants, at https://www.theice.com/customers.jhtml (last visited June 9, 2006) ("Through ICE's markets, participants have direct access to trade execution, real-time price information, market activity and unparallelled transparency in both futures and OTC energy markets. From the world's leading oil majors, to funds, utilities and financial institutions, energy market participants rely on ICE."); Clearing, at https://www.theice.com/futures—clearing.jhtml (last visited June 9, 2006) ("As the world's leading electronic energy exchange, ICE provides an unsurpassed forum for price discovery and risk management."); ICE Platform, https://www.theice.com/ice—platform.jhtml (last visited June 9, 2006) (ICE's electronic platform is the gateway to an open marketplace—one in which each participant has access to real-time price discovery and trading functionality.").

[140] *See, e.g.,* Statement of Jeffrey Sprecher, ICE Chairman and Chief Executive Officer, Intercontinental Announces 2003 Results, March 4, 2004, ("ICE's investment in the development of cleared OTC products was beneficial to a growing number of market participants who relied on clearing to ease credit constraints while managing risk. As a result, Intercontinental is well positioned to participate in the stabilizing OTC energy markets, and to facilitate the migration to electronic price discovery."), at https://www.theice.com/showpr.jhtml?id=558; Statement of Jef-

Continued

filings with the SEC that its OTC electronic trading facility performs a price discovery function, the CFTC has failed to initiate any type of inquiry to evaluate this issue. In light of the substantial evidence that the ICE electronic exchange is performing a price discovery function, the CFTC appears to have failed to carry out its statutory mandate to require ICE to publicly disseminate trading data.

V. THE COP'S BLIND EYE: U.S. ENERGY TRADES ON FOREIGN EXCHANGES

"Growth in our industry is certainly exceeding the ability of the regulators to get their heads around it."

—Jeffrey Sprecher, ICE Chairman and CEO [141]

ICE now operates two types of electronic energy exchanges. One is the ICE OTC exchange, which is registered in the United States. The other is ICE Futures, which is a futures exchange registered in London and regulated by the United Kingdom Financial Services Authority (FSA). Until January of this year, ICE Futures traded solely in European-based energy commodities. Within the past few months, however, the CFTC has permitted ICE Futures in London to use its trading terminals within the United States for the trading of U.S. energy commodities, including U.S. crude oil, U.S. gasoline, and U.S. home heating oil. The result is that persons located in the United States seeking to trade key U.S. energy commodities now can avoid all U.S. market oversight and reporting requirements simply by routing their trades through the ICE Futures exchange in London instead of the NYMEX in New York.

A. U.S. Energy Commodities Traded on Foreign Exchanges

In May 1999, the London International Petroleum Exchange (IPE) petitioned the CFTC to permit the IPE to make its electronic trading system available to IPE members in the United States. Specifically, the IPE desired that its members who were registered with the CFTC be able to electronically place orders from within the United States, or to electronically submit the orders of customers within the United States, to the IPE in London, without requiring the IPE to be fully regulated as a U.S. futures market under the CEA. The IPE's petition contained general information about the IPE's operations, the contracts traded on the IPE, its floor and trading procedures, a description of the United Kingdom regulatory structure applicable to the IPE, the IPE's procedures for compliance with the U.K. regulations, and procedures for sharing information with the CFTC.[142]

In November 1999, the CFTC granted the IPE's request by releasing a "no-action" determination, permitting the IPE to allow its members to electronically trade from within the United States without having to designate the IPE as a U.S. futures exchange

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frey Sprecher, Trading Technologies to Connect to ICE Energy Markets, March 17, 2004 ("We look forward to together delivering alternatives to the markeplace for electronic price discovery and expanded market access to a diverse group of participants."), at https://www.theice.com/showpr.jhtml?id=557.

[141] Comments at a conference, May 9, 2006. An audio replay of Mr. Sprecher's presentation can be downloaded from the ICE website, at https://www.theice.com/showpr.jhtml?id=2321 (last visited June 9, 2006).

[142] Letter from IPE to CFTC, May 14, 1999.

under the CEA. The CFTC wrote that its position was "restricted to providing relief from the requirement that IPE obtain contract market designation pursuant to [the CEA] and regulatory requirements that flow specifically from the contract market designation requirement in the event that the above-reference contracts are made available in the United States." The CFTC stated its "no-action position does not affect the Commission's ability to bring appropriate action for fraud or manipulation." It also stated that it retained the authority to "condition further, modify, suspend, terminate, or otherwise restrict the terms of the no-action relief provided herein, in its discretion." The initial no-action letter permitted the trading of IPE's natural gas, fuel oil, gas oil, and Brent crude oil contracts through IPE terminals in the United States. Subsequently, in 2002 and 2003, following the purchase of the IPE by ICE, the IPE received permission from the CFTC, through several amendments to the initial no-action letter, to trade U.K. natural gas, gas oil, and Brent crude oil contracts through the ICE electronic trading platform.

B. ICE Futures Trading of U.S. Energy Commodities

In mid-January 2006, ICE notified the CFTC that on February 3, 2006, it would begin trading a U.S. energy commodity—West Texas Intermediate crude oil, a crude oil that is produced in the United States—on its ICE Futures exchange in London, and that it would offer this contract for trading on its electronic trading devices that were operating in the United States under the no-action letters the CFTC had previously issued. Under CFTC policy in effect at the time, ICE Futures did not need an additional no-action letter to make this new contract available for trading in the United States; rather, ICE Futures needed only to provide prior notice to the CFTC.[143] This marked the first time that futures contracts for crude oil produced in the United States was traded on an exchange outside of the United States.

Since ICE began trading WTI crude oil futures on its London exchange, it has steadily increased its share of the WTI crude oil furtures market.[144] According to CFTC data, as of the end of April

[143] Notice of Statement of Commission Policy Regarding the Listing of New Futures and Options Contracts by Foreign Boards of Trade that Have Received Staff No-Action Relief to Place Electronic Trading Devices in the United States, 65 Fed. Reg. 41641 (July 6, 2000). On April 14, 2006, the CFTC revised its policy to require a foreign board of trade to provide the CFTC with at least ten days' notice prior to the commencement of trading from within the United States of any product on such board of trade. 71 Fed. Reg. 19877 (April 18, 2006).

[144] Prior to the listing of a WTI contract on the ICE Futures exchange, ICE offered a WTI contract for trading on its OTC electronic exchange. In a recent interview, ICE Chairman and CEO Jeffrey Sprecher described how ICE's development of a successful OTC contract for WTI paved the way for the introduction of the WTI contract on ICE Futures:

To the outside world, we launched WTI and it came out with a very high adoption rate. But the reality is ICE was working on that contract for a year and a half prior to its launch. One unique thing about ICE is that we can take a product and launch it as a bilateral OTC contract allowing the energy trading community to trade it. While they trade it we can work out many of the details, such as the size of the contract, delivery aspects, tick size and those things. Then we can add clearing to it and bring in more of the funds and speculators—if we get that going, then we can make it a futures contract. That's the process we went through with the WTI contract. It went from a bilateral swap to a cleared OTC contract to a futures contract.

And we're bringing other contracts through that conveyor belt process. In the first half of this year, we're bringing clearing to 50 bilateral contracts that we already offered.

ICE: "The market has spoken," Futures & Options Week, April 24, 2006. As previously discussed, quantitative data on the WTI contract traded on the ICE OTC electronic exchange is not readily available. According to former Federal Reserve Chairman Greenspan's recent testi-

Continued

2006, nearly 30 percent of WTI crude oil futures were traded on ICE Futures.[145] According to one energy trade publication, several of the large ICE stakeholders—BP, Total, and Morgan Stanley—were "doing their best to support the ICE WTI contract, with Goldman Sachs directing its traders to use the ICE platform rather than Nymex."[146]

ICE Futures has further expanded its reach into the U.S. energy commodities market. In addition to trading WTI crude oil futures on its London exchange, in April 2006, ICE Futures began trading futures in U.S. gasoline and home heating oil.

C. Implications for Oversight of U.S. Commodity Markets

The trading of U.S. energy commodities on the ICE Futures exchange in London from terminals within the United States permits traders within the United States to trade U.S. energy commodities without any U.S. oversight or regulation. This type of unregulated trading of a U.S. commodity from within the United States undermines the very purpose of the Commodity Exchange Act and the central mission of the CFTC—to prevent manipulation or excessive speculation of commodity prices "to the detriment of the producer or the consumer and the persons handling commodities." Without information about the trading of U.S. energy commodities, the CFTC cannot undertake, let alone accomplish, its mission.

Furthermore, the trading of U.S. energy commodities on foreign or unregulated OTC exchanges without any reporting to the CFTC undermines the reporting system for commodities traded on CFTC-regulated exchanges. With respect to traders that trade on both exchanges, the CFTC will be provided only partial data regarding the extent of their trades, thereby affecting the accuracy of the data to the CFTC.

For example, a trader wishing to disguise its position on the regulated market, or give the regulated market a false impression of its trading, could buy and sell an identical number of futures in different months; this would then be reported to the CFTC as a spread position. That same trader then could offset one of those positions, say, for example, the short position, on the unregulated exchange. In this example, the trader would have a net long position, but it would appear to the CFTC and the public, through the Commitment of Traders Report, as a spread position. Hence, both the CFTC and the public would have an inaccurate view of the composition of the market. Only the trader would know the correct position. It is not difficult to imagine other schemes to distort the CFTC's market data.

For the CFTC to be able to carry out its fundamental mission to protect the integrity of the U.S. commodity futures markets, all U.S. traders of U.S. energy futures or futures-like contracts must keep records and report large trades to the CFTC, regardless of where the trade takes place—on the NYMEX, an electronic exchange, or a foreign exchange. To continue the present situation, in which the CFTC does not police two of three major markets

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mony, during this period hedge funds and other institutional investors conducted a substantial amount of trading in crude oil in this market.

[145] CFTC data provided to the Subcommittee.

[146] *Market Forces: Big Oil increases market reach,* Energy Compass, March 24, 2006.

trading U.S. energy futures, is to turn a blind eye to an increasingly large segment of these markets, thereby impairing the ability to detect, prevent, and prosecute market manipulation and fraud. The United States needs to put the cop back on the beat in all of these key energy markets.

APPENDIX

MEASURING THE INCREASE IN SPECULATIVE TRADING

A. CFTC Commitment of Traders Report

One of the few direct, quantitative measures of the increased trading activity by speculative money managers in energy futures trading is provided by the Commodity Futures Trading Commission (CFTC) weekly report on futures trading activity. The CFTC publishes, on a weekly basis, a "Commitment of Traders" (COT) Report, providing, for each commodity traded on a U.S. futures exchange, statistical information regarding the extent and nature of trading in that commodity in the previous week. Oil industry consultant and analyst Matthew R. Simmons characterizes the COT Report as, "In the Land of the Blind, it is the 'One-Eyed King.'"[147] The report "tells who the players are," provides a "snapshot of Tuesday market close," and can "spot some long-term trends (after the fact)."[148]

For trades conducted on the regulated futures markets, the CFTC regulations require clearing houses and brokers to report, on a daily basis, futures positions on their books for traders that hold positions exceeding certain levels established by the CFTC ("reportable positions"). Traders holding futures positions are also required to file a report with the CFTC describing the nature of their business; the CFTC uses this data to classify each trader as "commercial" or "non-commercial." Commercial traders are those entities that use the commodity as part of their business, and hence use the futures markets for hedging; non-commercial traders are all other traders. The non-commercial category includes commodity pools, pension funds, hedge funds, and other types of managed money funds. Generally, non-commercial traders do not use the commodity in their normal course of business or purchase futures to hedge their exposure to changes in the price of those commodities; they are instead engaged in market speculation to profit from price changes.[149]

The COT Report provides, for each commodity: the total amount of open interest in that commodity, meaning the total of all futures and option contracts entered into and not yet offset by another transaction or delivery of the commodity.[150] The COT Report also provides the number of outstanding short and long positions held by commercial and non-commercial traders, respectively; and the number of "spreading" positions held by non-commercial traders. Spreading includes each trader's reported long and short positions

[147] Matthew R. Simmons, *Oil Prices, Volatility and Speculation,* Presentation at the IEA/NYMEX Conference, New York, New York, November 23, 2004.

[148] *Id.*

[149] In some cases, a hedge fund or other type of managed money fund may purchase futures for portfolio diversification to limit the fund's financial exposure to energy prices fluctuations.

[150] The CFTC defines "open interest" as "the total of all futures and/or option contracts entered into and not yet offset by a transaction, by delivery, by exercise, etc." Open interest held or controlled by a trader is referred to as that trader's position. For the CFTC's Commitment of Traders Futures and Options Combined Report, the open interest in options is calculated by mathematically computing the futures-equivalent of the unexercised option contracts. CFTC Backgrounder, *The Commitment of Traders Report,* at CFTC website, at http://www.cftc.gov/opa/backgrouder/opacot596.htm.

in the same commodity, to the extent they are balanced.[151] The report also identifies the number of long and short non-reportable positions, which is derived from the total open interest and the data on the reportable positions. Generally, reportable positions represent from 70–90 percent of the particular market.[152] The COT Report also provides data on the percentage of open interest and various other positions held by the largest four and largest eight traders. This data provides a gauge on how much of the market is dominated by the largest traders.

B. Increased Speculative Trading on the NYMEX

The increase in trading in oil and natural gas futures and options by money managers and speculators is seen clearly in the trends in the CFTC trader data over the past several years. Figure A–1 shows the increasing amount of open interest in crude oil and natural gas contracts traded on the NYMEX since 1998.

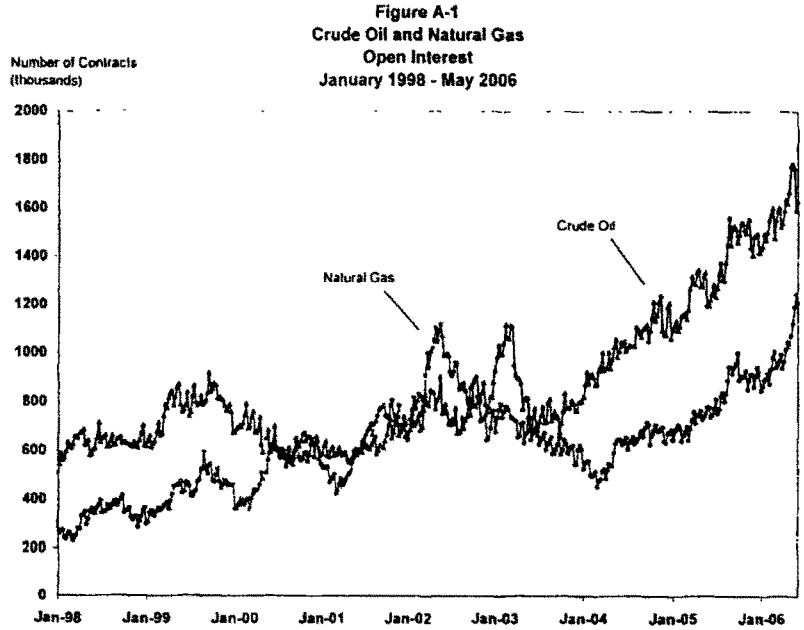

Figure A–1. The open interest in both crude oil and natural gas contracts has doubled since 2004. Data source: CFTC COT data.

A breakdown of the crude oil and natural gas open interest by the various types of positions tracked by the CFTC shows how there has been a shift in the composition of trading on the NYMEX over the past couple of years. As Figure A–2 demonstrates for crude oil contracts, and Figure A–3 demonstrates for natural gas

[151] For example, a trader might purchase a contract in the near-future, and, at the same time, sell a longer-term futures contract. This would be reported to the CFTC as a spread position. If the trader purchased two long futures contracts, and sold one short contract, it would be reported as one spread contract and one long contract.

[152] Haigh, Hranaiova and Overdahl, at pp. 3–4.

contracts, in the past few years there has been a significant increase in the amount of open interest held by non-commercial traders. In both markets, there has been a large increase in the amount of spreading—i.e. holding of both long and short positions that do not offset each other—by non-commercial traders. In short, the amount of speculative trading in crude oil and natural contracts has increased significantly in the past 2 years.

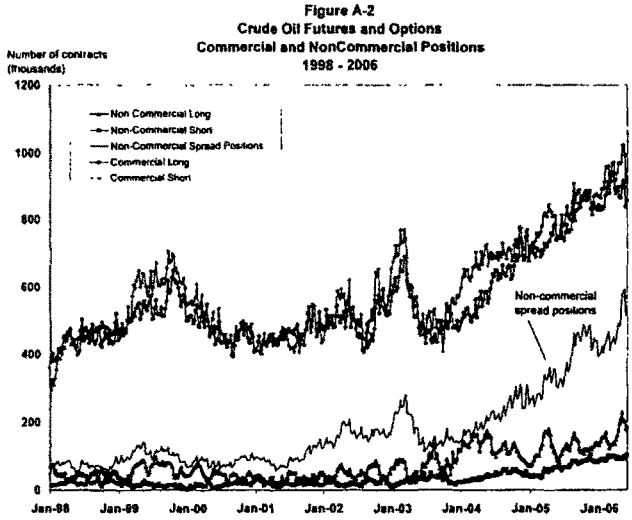

Figure A–2. The amount of speculative trading in crude oil contracts has increased significantly in the past 2 years, as evidenced by the increase in the number of non-commercial spread positions. Data source: CFTC.

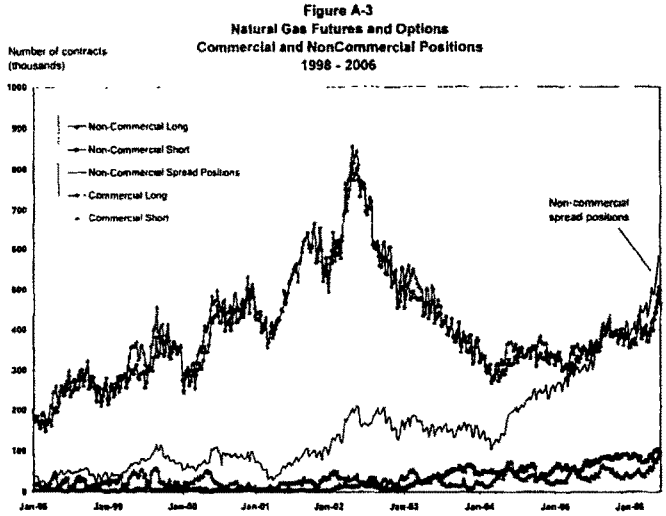

Figure A–3. The amount of speculative trading in natural gas contracts has increased significantly in the past 2 years, as evidenced by the increase in the number of non-commercial spread positions. Data source: CFTC.

Table A–1 presents similar information in tabular format. Additionally, Table A–1 shows the increase in the number of non-commercial traders over this same period. Although the number of commercial traders holding short and long positions has not varied by more than about 20 percent during this period, the number of non-commercial traders holding spread positions has quadrupled, so that there are now more non-commercial traders than commercial traders.

Table A-1
Increase in Non-commercial Trading in Oil Futures
1998 - 2005

CFTC COT Report Date	12/1/98	12/7/99	12/5/00	12/4/01	12/3/02	12/2/03	12/7/04	12/6/05
Open Interest (OI) in All Contracts	644,936	789,893	660,074	693,429	781,551	764,592	1,190,842	1,484,702
# Commercial Traders Long	98	93	79	74	80	86	85	82
# Commercial Traders Short	88	94	83	72	74	91	88	82
% OI Commercial Traders Long	72 8	73.2	70 2	71 1	66	62.9	62.7	56.2
% OI Commercial Traders Short	68	79.5	74.5	67 6	70.1	72.1	64 1	58 9
# Non-Commercial Traders Long	31	42	39	24	47	65	65	83
# Non-Commercial Traders Short	40	16	31	45	31	30	66	97
# Non-Commercial Traders Spread	33	36	42	46	50	60	93	128
% OI Non-Commercial Traders Long	4.7	6 1	6 8	2 8	4.6	10 9	7	9.3
% OI Non-Commercial Traders Short	8.7	1 2	2 1	5.3	2 7	2 2	4 6	5 6
% OI Non-Commercial Traders Spread	12	11	15 9	20 1	20 1	18.9	24 9	29.6

Table A–1. CFTC data shows a significant increase in the number of non-commercial traders and the percentage of open interest held by non-commercial traders in the past few years. Data source: CFTC.

Figure A–4 shows how the influx of investment into longer-term futures has raised the prices of futures contracts above the price of the nearer-term futures contracts ("contango"). The relative increase in the price of longer-term futures contracts has provided a financial incentive for oil companies and refiners to purchase additional oil and put it into inventory.

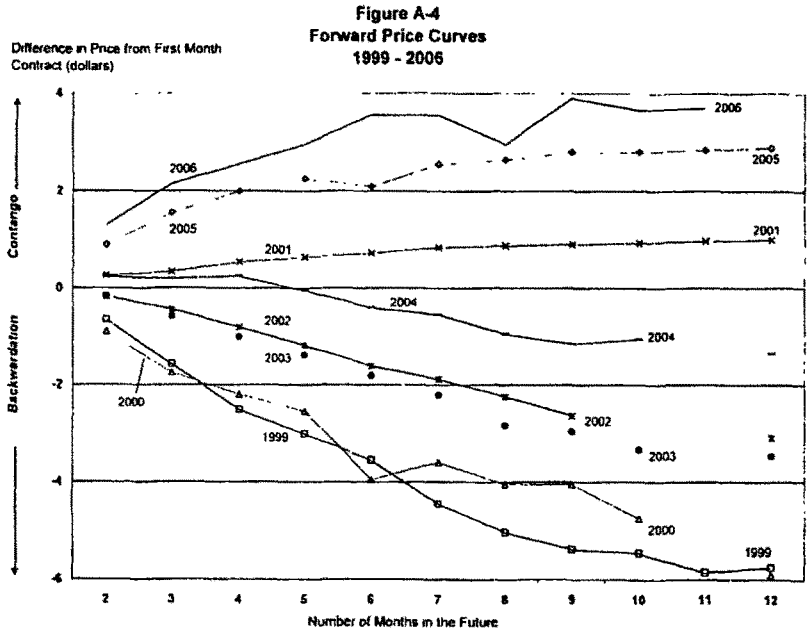

Figure A-4. In recent years longer-term futures prices have increased to levels higher than nearer-term futures contracts, providing a financial incentive to purchase and store oil. For years 1999–2002, the dates reflect the forward curve as of December 1 of that year. For other years, the dates reflect the foward curve as of December 2, 2003, December 2, 2004, December 6, 2005, and April 1, 2006. Data source: NYMEX.

C. Increased Speculative Trading on ICE

Because there are no reporting requirements for OTC trading, there are no publicly available quantitative measures of the extent of speculative trading in the OTC markets. Industry participants are not required to file large trader reports and the CFTC does not have any data to compile Commitment of Trader Reports. What little information has been publicly disclosed, however, indicates there has been a substantial growth in speculative activity on the ICE OTC market.

ICE financial statistics show a tripling in the amount of OTC commission fees it has received from a level of approximately $8 million in the fourth quarter of 2004 to approximately $24 million in the first quarter of 2006.[153] ICE reported an increase in the number of cleared Henry Hub natural gas contracts from 4,512,000 in 2003 to 15,887,000 in 2004 and then to 42,760,000 in 2005.[154] In the first 3 months of 2006, ICE reported a trading volume of 44,906 million North American natural gas contracts as compared to a trading volume of 23,838 million gas contracts for the first 3 months of 2003.[155]

[153] ICE Form 10–Q, at p. 22.
[154] ICE Form 10–K, at p. 73.
[155] ICE Form 10–Q, at p. 22 (each contract representing one million BTUs).

The ICE financial statistics indicate that a large part of this growth can be attributed to increased trading by hedge funds, managed money, and individual speculators. Table A–2 provides the most recent breakdown provided by ICE of the composition of ICE participants.

Table A–2

ICE OTC Participants

OTC Participants Trading (as % of total commissions)	Year ended December 31,		
	2003	2004	2005
Commercial companies (including merchant energy)	64.1	56.5	48.8
Banks and financial institutions	31.3	22.4	20.5
Hedge funds, locals and proprietary trading shops [156]	4.6	21.1	30.7

Table A–2. Hedge funds and other speculators have significantly increased their use of OTC electronic markets. Data source: ICE Form 10–K, at p. 73.

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[156] The term "local" refers to an individual who commits his or her own capital for speculative trading on an electronic exchange. A "proprietary trader" is a professional trader hired by a firm to trade that firm's money. *See, e.g.,* Jim Kharouf, *Prop Shops and Trading Schools Raise the Bar, Stocks,* Futures & Options Magazine, January 2004.

United States Senate

WASHINGTON, DC 20510

October 18, 2007

The Honorable Samuel W. Bodman
Secretary
U.S. Department of Energy
1000 Independence Ave, SW
Washington, DC 20585

Dear Mr. Secretary,

We are writing to express our extreme concern at the Department of Energy's continued deposits of oil into the Strategic Petroleum Reserve (SPR) despite record high crude oil prices and to respectfully request that you immediately postpone further deliveries.

The Department's insistence on further reducing commercial oil supplies at a time of tight supply and record prices has exacerbated the current oil price spike, now nearing $90 per barrel. The high price for crude oil has led to record prices for heating oil as well as high prices for all other petroleum products, including gasoline, diesel fuel, and jet fuel. The dramatic rise in crude oil prices also has pushed up the price of natural gas. These commodities are vital to millions of American families and businesses and continued price increases threaten our national well-being. The Department should be taking prompt action to alleviate the current crisis in energy prices, rather than reducing oil supplies just when they are needed most.

The Energy Department in September deposited 2.6 million barrels of oil into the SPR and reportedly plans to remove another 6 million barrels from the market and place them into the SPR over the next few months. This action sends a message to the market place that the Administration is comfortable with current price levels, and can only add to U.S. crude oil prices and the prices of related commodities. In addition, last week the Department issued another solicitation for additional deposits of 13 million barrels into the SPR beginning next February. Unless the Department changes the manner in which it manages this program, the removal of another 13 million barrels of oil from the market could fuel further increases in oil prices in the spring and summer of 2008.

The Department's current policy is not only bad for consumers, but it's also bad for taxpayers. Based on the Department's own forecasting of crude oil prices and on current futures prices, a deferral of SPR deliveries for 12 months would allow the Department to acquire oil at a discount of more than $10 per barrel compared to today's prices. As DOE plans to add several million barrels to the SPR under the current schedule, the total savings from one-year deferrals would save the taxpayers tens of

Permanent Subcommittee on Investigations
EXHIBIT #10

millions of dollars. These funds could be used to develop alternative technologies that would genuinely make our Nation secure from energy disruptions, such as hydrogen, biomass, solar, wind, geothermal, hydropower, vehicle energy efficiency, building energy efficiency, industrial efficiency and weatherization.

In the Energy Policy Act of 2005, Congress directed the Department to develop criteria for when the SPR would be filled and specifically required the Department to minimize costs, including foregone revenue from Royalty-in-Kind oil and to avoid adversely affecting current and futures prices, supplies, and inventories of oil. As the legislative history of this provision shows, Congress intended for the Department to use a market-based approach to determining when to fill the SPR. We are concerned that the Department's decision to fill the SPR under current market conditions is inconsistent with these statutory requirements. We therefore respectfully request that you immediately suspend and defer filling the SPR.

Sincerely,

Carl Levin
United States Senator

Ron Wyden
United States Senator

Jeff Bingaman
United States Senator

Jack Reed
United States Senator

Claire McCaskill
United States Senator

Byron L. Dorgan
United States Senator

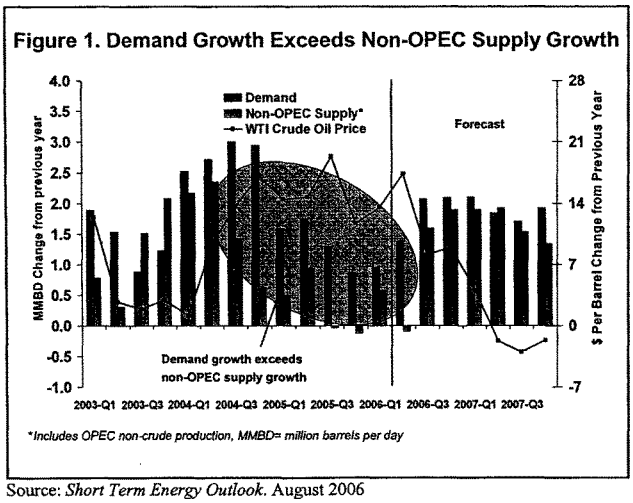
STEO Supplement: Why are oil prices so high?

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.

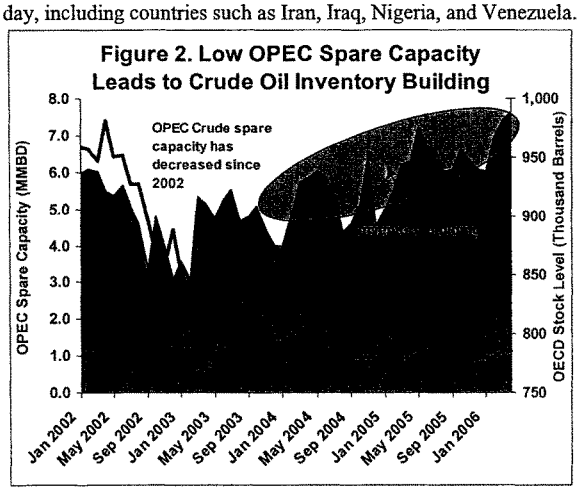
2) **Non-OPEC supply has failed to meet expectations.** Slower non-OPEC production growth relative to demand growth has raised crude oil production expectations from OPEC countries and has therefore lowered surplus production capacity (see Figure 1). The largest detriment to non-OPEC supply growth in 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 .

Permanent Subcommittee on Investigations
EXHIBIT #11



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.



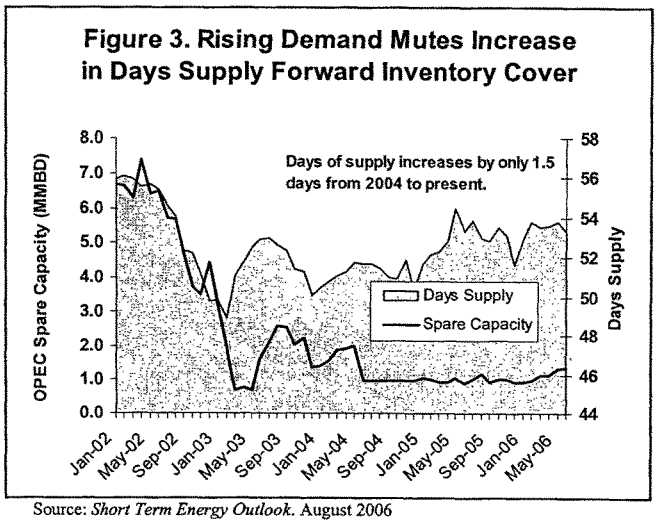
Source: *Short Term Energy Outlook.* August 2006

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 word 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.

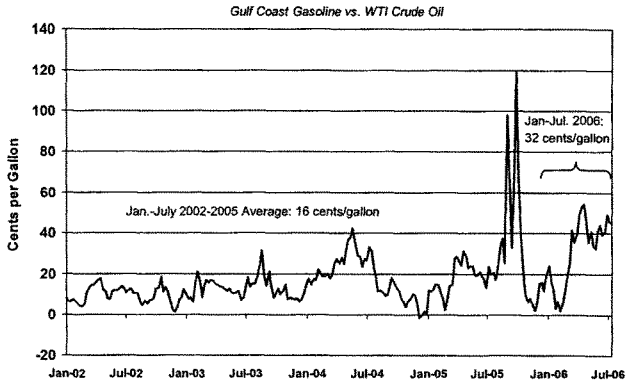
Iran. Iran, unlike Saudi Arabia, does not have any surplus production capacity that could be brought online, i.e., the country is producing at the maximum rate possible. Iran's existing oilfields have a natural decline rate estimated at 8-13 percent per year (300,000-500,000 bbl/d). Current investment 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 spreads[1] 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.

Figure 4. Strong Wholesale Gasoline Spreads Encourage High Refinery Production



Source: EIA calculations from Reuters spot prices.

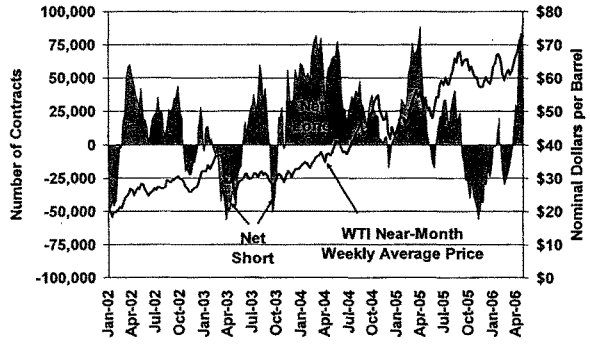
6) **Weather has disrupted supplies.** As discussed briefly above, last year's oil supply disruption in the Gulf of Mexico severely hurt the prospects for non-OPEC supply growth and had both short and long-term impacts on the WTI price. The Gulf of Mexico region is an important source for U.S. production 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.

Figure 4. Changes in Speculative Activity Do Not Explain Changes in WTI Prices.



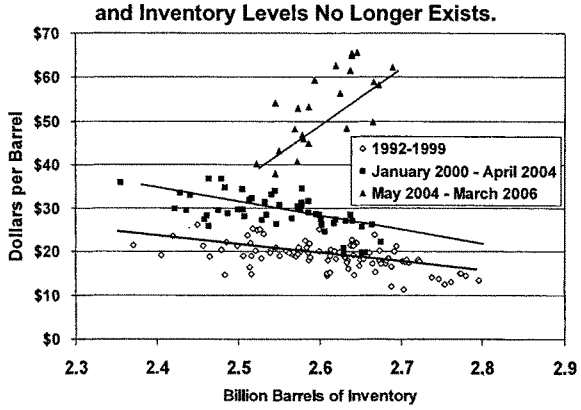
"Net Position of Non-Commercial Participants in WTI Futures Since 2002 vs. WTI Spot Price"

Source: NYMEX Commitment of Traders Report, Commodity Futures Trading Commission. Graph includes data up to May 2, 2006.

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.

Figure 5. Traditional Inverse Relationship Between WTI and Inventory Levels No Longer Exists.



Sources: Reuters database and International Energy Agency database, May 2006.

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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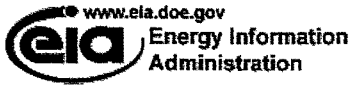


November 2007

Short-Term Energy Outlook Supplement:

Why Are Oil Prices So High? [1]

Crude oil prices have increased dramatically in recent years. West Texas Intermediate (WTI) prices, which remained around $20 per barrel during the 1990's, rose, on average, from about $31 per barrel in 2003 to $57 per barrel in 2005, and to $66 per barrel in 2006. In 2007, WTI crude oil prices have climbed further, to average over $85 per barrel in October, topping $90 per barrel at the end of the month. The EIA believes that the following supply and demand fundamentals are the main drivers behind recent oil price movements:

1) Strong world economic growth driving growth in oil use,
2) Moderate non-Organization of the Petroleum Exporting Countries (OPEC) supply growth,
3) OPEC members' production decisions,
4) Low OPEC spare production capacity,
5) Organization for Economic Cooperation and Development (OECD) inventory tightness,
6) Worldwide refining bottlenecks, and
7) Ongoing geopolitical risks and concerns about supply availability.

Oil markets have been drawing increased interest and participation from investors and financial entities without direct commercial involvement in physical oil markets. The role of these non-commercial futures market participants in recent price developments is difficult to assess, particularly over short time intervals. However, general principles favor a focus on fundamentals rather than consideration of alternative price drivers, when the explanatory power of fundamentals is high. As outlined below, EIA believes that fundamentals provide the primary explanation for the recent trend in oil prices.

[1] Contact: Erik Kreil (Erik.Kreil@eia.doe.gov)

Permanent Subcommittee on Investigations
EXHIBIT #12

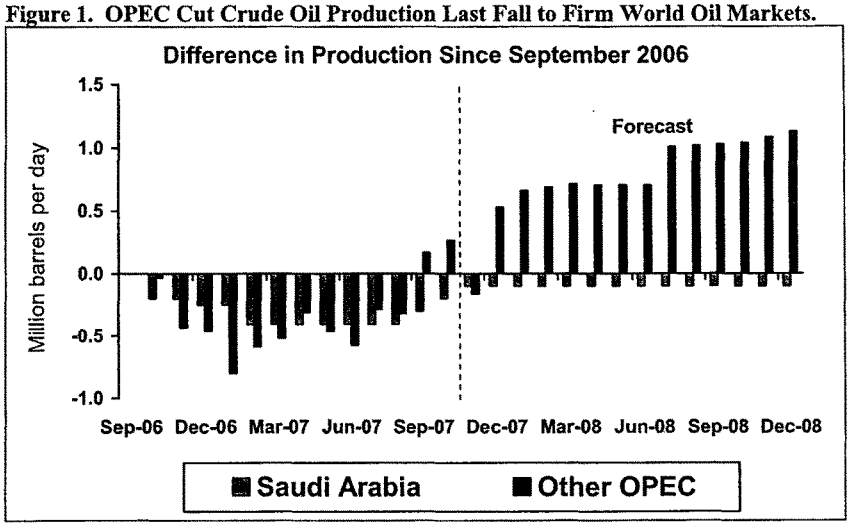
1) Strong world economic growth supports growth in global oil consumption despite higher price levels. Strong world economic growth, especially in traditionally large oil-consuming regions, has resulted in strong world oil demand. When the volume of oil demanded exceeds the volume of oil supplied, oil prices rise to bring oil consumption in line with supply. Global oil consumption rose by 1.1 million barrels per day (bbl/d) in 2006, and is projected to rise by 1.1 million bbl/d in 2007 and 1.5 million bbl/d in 2008. China, the United States, and the Middle East countries are the main drivers of consumption growth, and China and the United States alone are projected to account for half of world oil consumption growth in 2007 and 2008. While high oil prices have helped to slow economic growth in industrialized countries such as the United States, the Chinese economy has shown few signs of slowing down. The economies of oil exporting countries in the Middle East and of Russia have also benefitted from higher oil revenues, boosting oil consumption. In addition, the decline in the value of the dollar against other currencies also supports continued oil consumption growth in foreign countries. Oil is traded globally in dollars, and a declining dollar has made oil less expensive in foreign currencies than it is in dollars, since foreign retail prices are priced in local currencies.

2) A key factor contributing to high prices has been the inability of non-OPEC production growth to keep pace with global oil consumption growth. Non-OPEC production increased by 0.2 million bbl/d in 2006, and is projected to rise by 0.6 and 0.9 million bbl/d in 2007 and 2008, respectively. Non-OPEC production growth remains concentrated in a few areas and it has faced some downward revisions to expectations due to delays in projects and growing production declines in some non-OPEC nations, especially Mexico, the United Kingdom, and Norway. The former Soviet Union, including Russia and the Caspian states, are expected to account for the majority of non-OPEC growth over the forecast period. When non-OPEC supply growth is less than growth in global consumption, the gap needs to be filled by OPEC members' production increases or draws from inventories. If this gap is not filled by OPEC members' production increases and cannot be fully met by a drawdown in inventory, the price of oil must rise to bring consumption in line with production. Furthermore, because petroleum demand is relatively price inelastic in the short run, large price movements are required to bring consumption in line with available supply. OPEC members cut back on production for much of 2007, resulting in an inventory draw down and putting upward pressure on prices.

3) OPEC members' production decisions have played a critical role in determining price trends. Facing rising OECD inventories and relatively weak prices late last year, OPEC announced plans to cut production in November 2006 and February 2007 by 1.2 and 0.5 million bbl/d, respectively. Although OPEC members' actual production cuts (Figure 1) were about half of the planned amounts, the cuts reversed the slide in world oil prices.

In response to rising prices and falling OECD inventories, OPEC recently announced plans to raise production by 0.5 million bbl/d beginning in November 2007. However, OPEC's announcement has not yet dampened upward price pressure, and it is unlikely that these higher volumes will be enough to halt the downward trend in commercial inventories over the next several months. OPEC agreed to reassess the situation at its meeting on December 5, but could also do so at its heads-of-state meeting on November 17-18, in Riyadh. So far, OPEC has not signaled the need for a change in its production policy.

Figure 1. OPEC Cut Crude Oil Production Last Fall to Firm World Oil Markets.

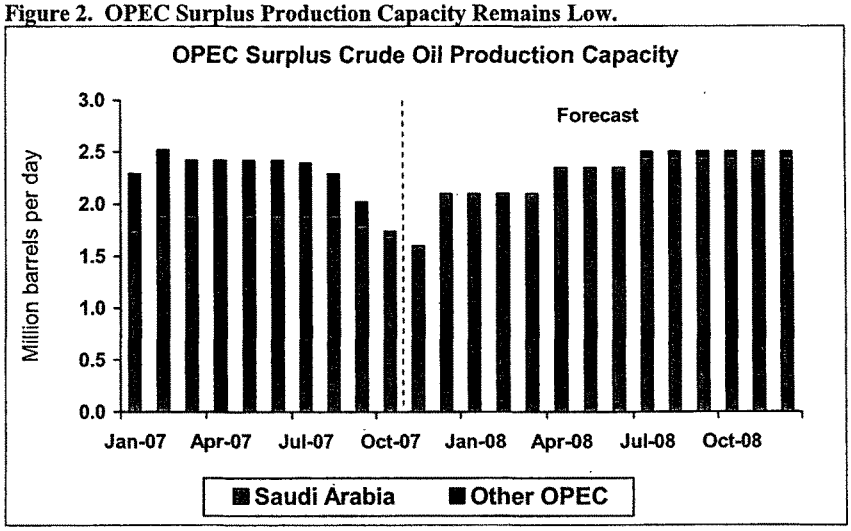


Source: Energy Information Administration, *Short-Term Energy Outlook*, November 2007.

4) Fairly low OPEC surplus production capacity (concentrated in Saudi Arabia) leaves the market with little flexibility to respond to surprises in supply and demand. EIA's outlook for continued rising oil consumption

and moderate non-OPEC production growth suggests that OPEC members' crude production will average about 31.5 million bbl/d in 2008, an increase of about 500,000 bbl/d from fourth quarter 2007 levels. Under this scenario, world surplus production capacity will remain fairly low at around 2 to 3 million bbl/d (Figure 2).

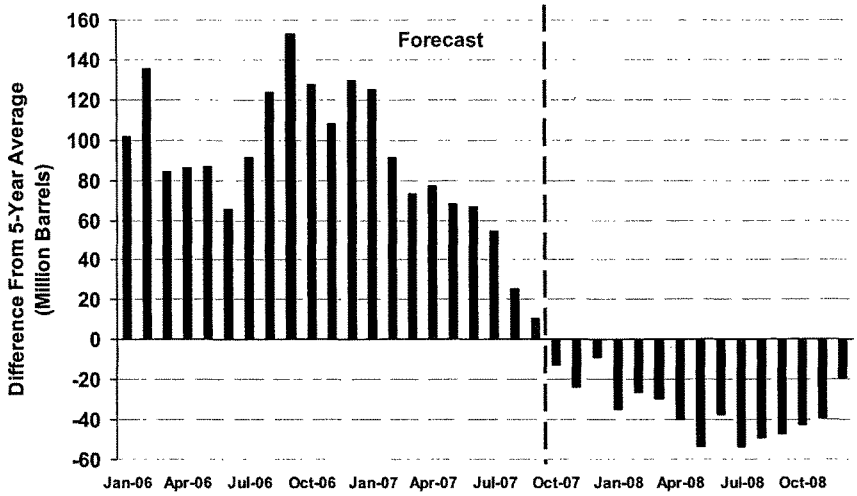
Figure 2. OPEC Surplus Production Capacity Remains Low.



Source: Energy Information Administration, *Short-Term Energy Outlook*, November 2007.

5) Total OECD commercial inventories are declining. While OECD commercial inventories were 150 million barrels above their 5 - year average at the end of September 2006, EIA projects that OECD commercial stocks will be about 10 million barrels below the 5 - year average by the end of this year (Figure 3). Even with a moderate increase in OPEC output beginning in the fourth quarter of 2007, EIA projects that inventories will continue to decline relative to the average in the first quarter of 2008, and will move toward the lower end of the 5 - year range through 2008.

Figure 3. OECD Commercial Stocks: Record Highs to Near Normal Levels.



Source: Energy Information Administration, *Short-Term Energy Outlook*, November 2007.

6) Excess capacity in the refining industry has been shrinking as refined product demand has grown. Low excess refining capacity leaves less of a buffer for periods when the supply and demand balance becomes unusually tight. Furthermore, low excess refining capacity leaves little flexibility to economically accommodate unplanned refinery outages. In OECD Europe, total commercial product inventory levels actually declined from May to August 2007 by over 400,000 barrels, in contrast to the last 5 years when inventories increased on average during these months by more than 600,000 barrels.

7) Geopolitical risks raise supply concerns. 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 inventory demand and crude oil prices. A lack of political stability continues to threaten production in several OPEC nations, including Iraq, Nigeria, Venezuela, and Iran.

- **Iraq** is struggling to revitalize its oil industry after decades of wars, sanctions, and underinvestment. Exports of Kirkuk crude oil from the

country's north are sporadic as sabotage and technical problems have mostly idled the pipeline since the war in Iraq began in March 2003, preventing exports from returning to the pre-war rate. The threat of a possible Turkish incursion against Kurdish rebels in Iraq has added to supply worries.

- Supplies of crude from **Nigeria**, the world's eighth-largest oil exporter, have been cut since February 2006 because of militant attacks on the country's oil industry. Oil companies have detailed about 547,000 bbl/d of shut-in Nigerian production due to attacks and sabotage.

- **Venezuelan oil** production has never fully recovered since December 2002, when political strife brought Venezuelan production to a halt. Venezuela's decision to fully nationalize its oil industry has led to further worries that production will continue to fall as oil revenues that could have been re-invested in its oil industry are used instead to meet other national goals.

- Oil consumers are concerned about supply disruptions in **Iran**, the world's fourth-biggest exporter, which is locked in a dispute with the West over its nuclear program. Recently, tighter U.S. sanctions have also weighed on the market.

Release: 5366-07
For Release: August 1, 2007

Marathon Petroleum Company LLC Agrees to Pay $1,000,000 Civil Penalty to Settle U.S. Commodity Futures Trading Commission Charges of Attempted Manipulation in Crude Oil Markets

CFTC Order Finds That Marathon Petroleum Company LLC Attempted to Manipulate Crude Oil Prices by Influencing the Platts Crude Oil Assessment

Washington, D.C. – The U.S. Commodity Futures Trading Commission (CFTC) today announced the issuance of an order filing and simultaneously settling charges against **Marathon Petroleum Company (MPC)**, a subsidiary of Marathon Oil Corporation, based in Findlay, Ohio, for attempting to manipulate a price of spot cash West Texas Intermediate (WTI) crude oil delivered at Cushing, Oklahoma on November 26, 2003, by attempting to influence downward the Platts market assessment for spot cash WTI for that day.

The August 1, 2007, order requires, among other things, that MPC pay a $1,000,000 civil monetary penalty.

"West Texas Intermediate crude oil prices have an enormous impact on the daily lives of American citizens. The CFTC continues to aggressively ferret out illegal conduct in the energy sector. As the guardian of the nation's commodity markets, this case is yet another signal to the markets that we hold all companies accountable for their trading activities," said Gregory Mocek, the CFTC's Director of Enforcement.

The Platts market assessment for WTI is derived from trading activity during a particular 30-minute period of the physical trading day. The Platts market assessment for WTI is used as the price of crude oil in certain domestic and foreign transactions. At the time in question, MPC priced approximately 7.3 million barrels of physical crude oil per month off the Platts market assessment for WTI.

As a net purchaser of foreign crude oil priced off of the Platts spot cash WTI assessment, if its conduct was successful, MPC would have benefited from a lower Platts spot cash WTI assessment. The order finds that, on November 26, 2003, MPC purchased NYMEX WTI contracts with the intention of selling physical WTI during the Platts window at prices intended to influence the Platts WTI spot cash assessment downward. Further, during the Platts window, MPC knowingly offered WTI through the prevailing bid at a price level calculated to influence downward the Platts WTI assessment.

The following CFTC Enforcement Division staff were responsible for the case: Allison Lurton, Maura Viehmeyer, Laura Gardy, Kevin Webb, Gretchen L. Lowe, and Vincent A. McGonagle.

Last Updated: July 31, 2007

Permanent Subcommittee on Investigations
EXHIBIT #13

Release: 5402-07
For Release: October 25, 2007

Former BP Trader Paul Kelly Agrees to Pay $400,000 Civil Penalty to Settle U.S. Commodity Futures Trading Commission Charges of Attempted Manipulation of the NYMEX Unleaded Gasoline Futures Contract

CFTC Order Finds that Kelly Attempted to Manipulate the Price Spread Between the November and December 2002 Futures Contracts

Washington, DC – The U.S. Commodity Futures Trading Commission (CFTC) announced today the issuance of an order filing and simultaneously settling charges against **Paul K. Kelly**, a former gasoline trader for BP Products North America Inc. (BPPNA), for attempting to manipulate the price spread between the November and December 2002 unleaded gasoline futures contracts traded on the New York Mercantile Exchange (NYMEX) on October 31, 2002, the last day of trading for the November 2002 unleaded gasoline futures contract.

The October 25, 2007 order imposed a $400,000 civil monetary penalty. The order also imposed a prohibition on Kelly from applying for registration, engaging in any activity requiring registration, or acting as a principal of any registered entity or person.

The order finds that Kelly was primarily responsible for obtaining physical, finished gasoline as well as components for gasoline for BPPNA's northeast commercial needs. According to the order, unleaded gasoline was in short supply in October 2002 and early November 2002, and Kelly was aware of the shortage. The order finds that despite the fact that BPPNA held a long position of 1,352 November 2002 unleaded gasoline contracts – 52 more than its stated commercial need of 1,300 contracts – Kelly bought an additional 720 November 2002 unleaded gasoline contracts through the course of the day on October 31, 2002. The Commission found that Kelly engaged in this conduct with the intent to affect the price spread between the November and December 2002 NYMEX unleaded gasoline futures contracts.

The Commission wishes to thank the New York Mercantile Exchange for its support and assistance with this matter. The following CFTC Division of Enforcement staff members are primarily responsible for this case: John W. Dunfee, Paul G. Hayeck, Joan M. Manley, Lael Campbell, Mary Kaminski, and Ed Riccobene.

Last Updated: October 25, 2007

Release: 5405-07
For Release: October 25, 2007

BP Agrees to Pay a Total of $303 Million in Sanctions to Settle Charges of Manipulation and Attempted Manipulation in the Propane Market

Washington, DC – The U.S. Commodity Futures Trading Commission (CFTC) today announced the entry of a consent order by the Honorable Ruben Castillo of the Northern District of Illinois (Order) settling charges brought against **BP Products North America Inc. (BP)**, a corporate entity based in Warrenville Illinois, for manipulating and attempting to manipulate the price of TET propane in February 2004, for cornering the market for TET propane in February 2004, and for attempting to manipulate the price of TET propane in April 2003. The CFTC commenced this civil action against BP on June 28, 2006 (see Commodity Futures Trading Commission v. BP Products North America, Inc., 1:06-cv-03503 (N.D. Ill.) and CFTC Press Release 5193-06, June 28, 2006).

"This case demonstrates that the CFTC will aggressively combat manipulation in the nation's energy markets. Disrupting the energy markets hurts American consumers, and traders who engage in such misconduct face serious consequences. This announcement marks the largest manipulation settlement in CFTC history and requires the return of approximately $53 million to victims of the company's misconduct," said CFTC Acting Chairman Walt Lukken. "BP engaged in a massive manipulation – the magnitude of this settlement reflects that the Commission will not tolerate trading abuses in our open and competitive markets."

In a related filing, the Criminal Division, Fraud Section of the United States Department of Justice (DOJ) also announced the simultaneous filing of an information and entry into a deferred prosecution agreement with BP America Inc. based upon the same underlying conduct.

The October 25, 2007 CFTC consent order requires that BP pay a $125 million civil monetary penalty to the CFTC, establish a compliance and ethics program, and install a monitor to oversee BP's trading activities in the commodities markets. The consent order also recognizes the payment of approximately $53 million by BP into a restitution fund for victims.

The DOJ deferred prosecution agreement requires BP America to pay a $100 million criminal penalty, plus $25 million into a consumer fraud fund, as well as payments to the restitution fund and installment of the monitor as noted above.

Accordingly, the total monetary sanction that BP is required to pay to resolve the civil and criminal aspects of the unlawful conduct in the TET propane market is approximately $303 million.

The TET propane market refers to propane that is deliverable at the TEPPCO storage facility in Mont Belvieu, Texas or anywhere within the TEPPCO pipeline system. The TEPPCO pipeline runs from Mont Belvieu, Texas up through Ohio, into New York, Pennsylvania and Illinois. The TEPPCO pipeline is the only pipeline that transports propane from Mont Belvieu to the Northeast and Midwest regions of the United States.

"Although this case was difficult, our professional staff used strategic techniques during thousands of hours of investigation to uncover BP's misconduct. They effectively rooted out evidence of the defendant's intentions. This settlement shows that BP has decided to take positive steps to rectify the situation and provide relief to those who were impacted by BP's misdeeds," said Gregory Mocek, CFTC's Director of Enforcement.

The Order finds that in February 2004, BP employees sought to, and did, corner the TET propane market for the purpose of dictating prices to other market participants in order to obtain a significant trading profit. The Order finds that by engaging in this conduct, BP employees violated the Commodity Exchange Act's prohibitions against manipulating the price of a commodity and cornering a commodity market. The Order finds that BP employees attempted to manipulate the price of TET propane in April 2003 by engaging in similar conduct.

The CFTC would like to thank the Department of Justice and U.S. Postal Inspection Service for their cooperative enforcement assistance in this matter.

The following CFTC Enforcement Division staff are responsible for the case: Joseph Konizeski, Deputy Director Joan Manley, Judy Lee, Charlotte Ohlmiller, and Associate Director Paul Hayeck.

Last Updated: October 25, 2007

Release: 5359-07
For Release: July 25, 2007

U.S. Commodity Futures Trading Commission Charges Hedge Fund Amaranth and its Former Head Energy Trader, Brian Hunter, with Attempted Manipulation of the Price of Natural Gas Futures

Complaint Also Alleges That Amaranth Advisors L.L.C. Tried to Cover Up the Conduct by Making False Statements to the New York Mercantile Exchange (NYMEX)

Washington, D.C. – The U.S. Commodity Futures Trading Commission (CFTC) announced today the filing of a civil enforcement action in the United States District Court for the Southern District of New York against **Amaranth Advisors, L.L.C., Amaranth Advisors (Calgary) ULC (collectively "Amaranth")**, and **Brian Hunter**, alleging that defendants engaged in a scheme of price manipulation that violated the Commodity Exchange Act, as amended (the Act). Specifically, the Complaint alleges that the defendants intentionally and unlawfully attempted to manipulate the price of natural gas futures contracts on the NYMEX on February 24 and April 26, 2006. The CFTC is seeking permanent injunctive relief, an award of civil penalties, and other remedial and ancillary relief as is necessary.

"This case demonstrates the Commission's ongoing vigilance to punish those who attempt to compromise the integrity of the futures markets," said CFTC Acting Chairman Walter Lukken. "The CFTC continues in its unwavering determination to ensure that the futures markets operate in an open and competitive manner free from price distortions."

"The CFTC stands ready to enforce the provisions of the Commodity Exchange Act against those who attempt to manipulate U.S. futures and commodity prices. The filing today sends an important message to market participants that such conduct will be met with appropriate sanctions," CFTC Commissioner Michael Dunn added.

February 24, 2006 was the last day of trading ("expiry day") for the March 2006 NYMEX natural gas futures contract and April 26, 2006 was the expiry day of the May 2006 NYMEX natural gas futures contract. The settlement price of each NYMEX natural gas futures contract is determined by the volume weighted average of trades executed from 2:00-2:30 p.m. (the "closing range") on the expiry day of such contracts.

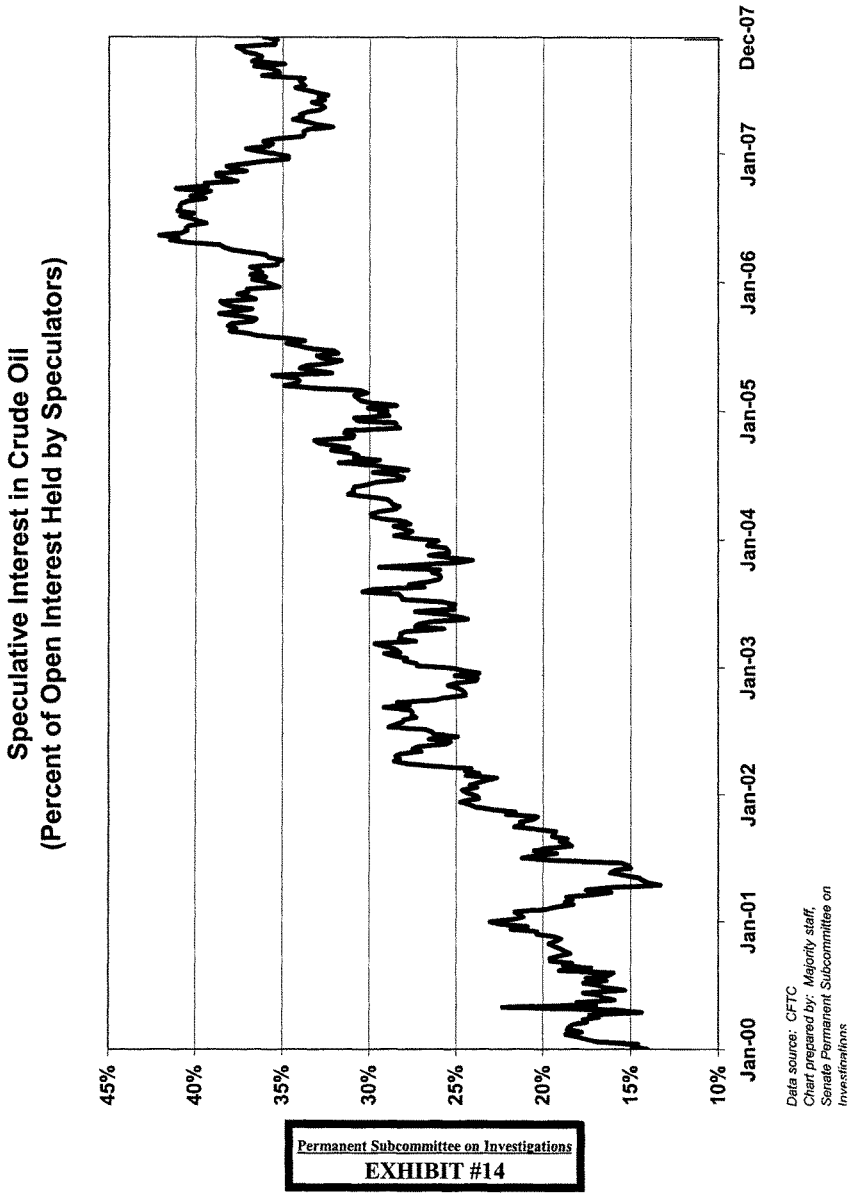
The Complaint alleges that, for each of the expiry days at issue, the defendants acquired more than 3,000 NYMEX natural gas futures contracts in advance of the closing range, which they planned to, and for the most part did, sell during the closing range. The Complaint also alleges that defendants held large short natural gas financially-settled swaps positions, primarily held on the IntercontinentalExchange (ICE). The settlement price of the ICE swaps is based on the NYMEX natural gas futures settlement price determined by trading done during the closing range on expiry day. The Complaint alleges that defendants intended to lower the prices of the NYMEX natural gas futures contracts to benefit defendants' larger swaps positions on ICE and elsewhere.

The Complaint also alleges that, in violation of the Act, and in response to an inquiry from NYMEX about the April 26, 2006 trading, Amaranth Advisors L.L.C. made false statements to NYMEX to cover up defendants' attempted manipulation. For more detail on the allegations, please see the attached excerpts from the Amaranth Complaint.

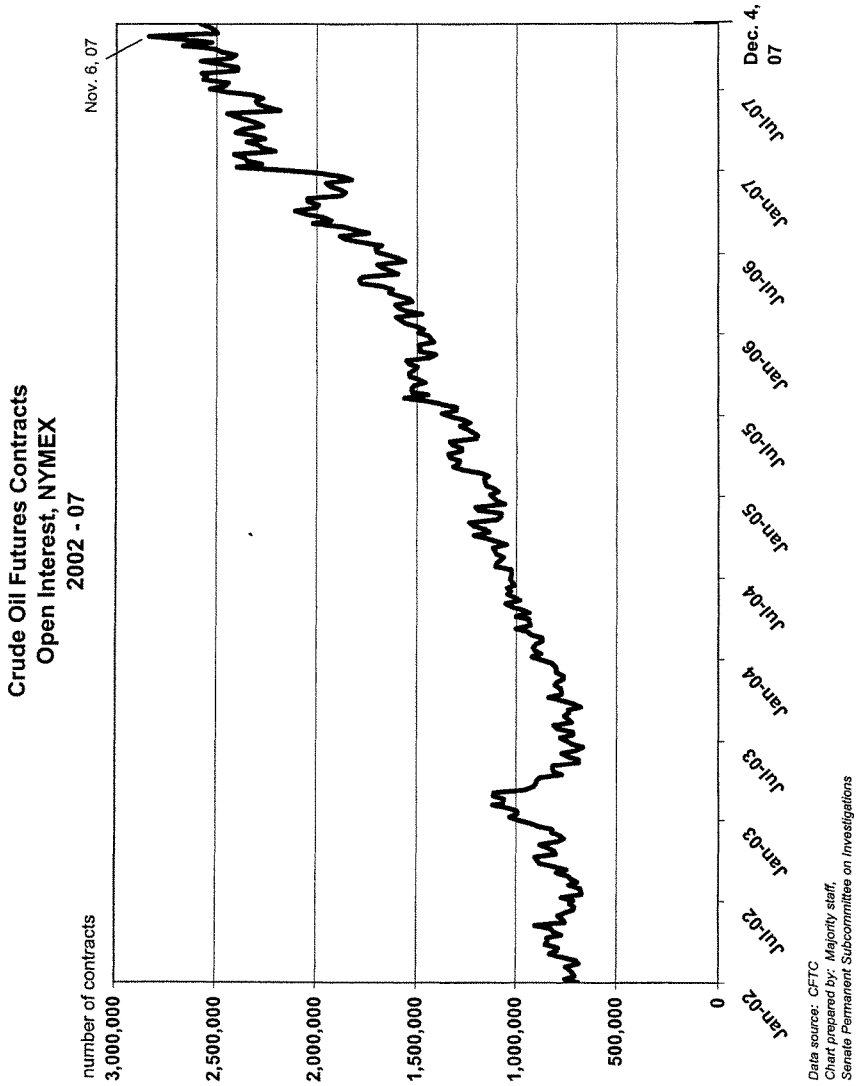
The Commission wishes to thank the Federal Energy Regulatory Commission (FERC), the Securities and Exchange Commission, and the New York Mercantile Exchange for their assistance with this investigation. Of particular note is the CFTC's coordination with the FERC on this matter, per the agencies' Memorandum of Understanding.

The following CFTC staff members are responsible for this matter: Michael C. McLaughlin, Elizabeth C. Brennan, David Oakland, Linda Y. Peng, Karin N. Roth, W. Derek Shakabpa, David W. MacGregor, Michael Penick, Manal Sultan, Lenel Hickson, Jr., Stephen J. Obie, and Vincent McGonagle.

Last Updated: July 31, 2007



Permanent Subcommittee on Investigations
EXHIBIT #14



Permanent Subcommittee on Investigations
EXHIBIT #15

CNNMoney.com

$100 oil and the 'S' word

Is it growing demand and tight supply, or merely rampant speculation that has pushed crude to record highs?

By Steve Hargreaves, CNNMoney.com staff writer

November 27 2007: 2:35 PM EST

It's been rumored Goldman Sachs has over $80 billion in the market.

Its influence is so big, traders refer to the day of the month when the bank sells the current month contract and buys the future month as the "Goldman roll" due to its effect on price. When Goldman last month told its clients to sell oil when it approached the mid-90's, crude lost over $3 in one day

Chart prepared by:
Office of Sen. Dorgan

Permanent Subcommittee on Investigations
EXHIBIT #16

Permanent Subcommittee on Investigations
EXHIBIT #17

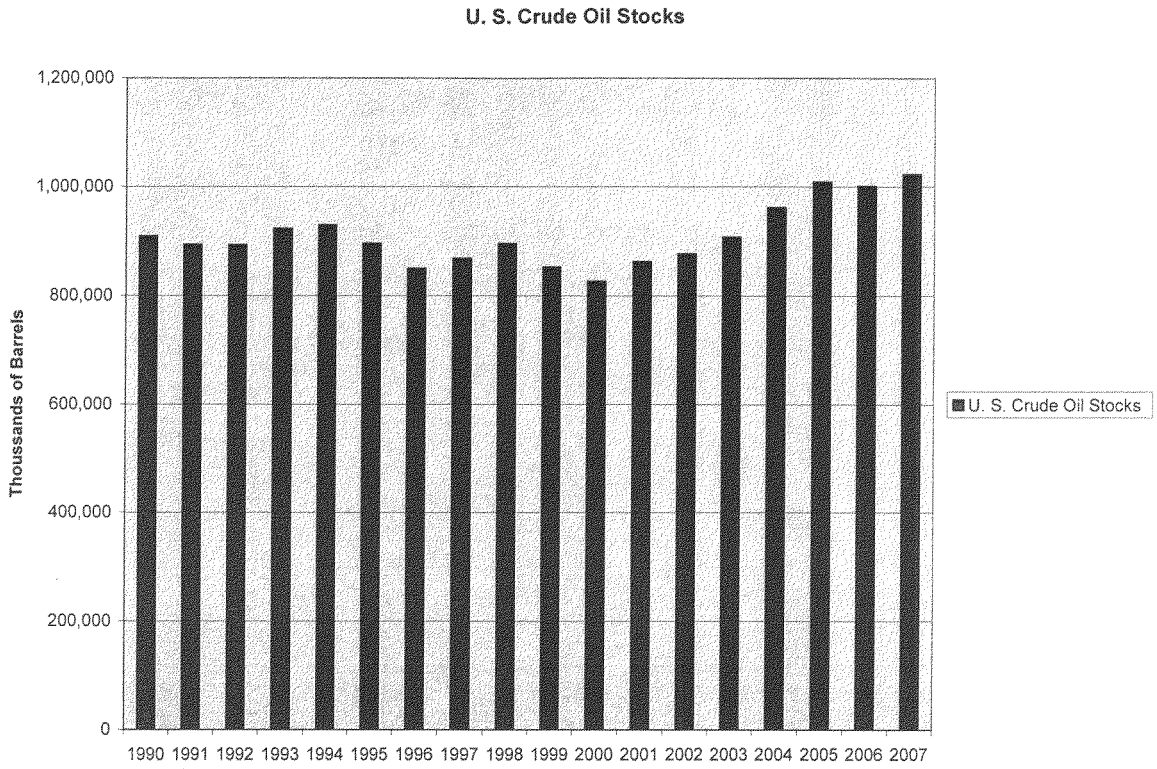


Chart prepared by:
Office of Sen. Dorgan

A 32-year-old energy trader manipulated natural gas prices and helped lead to the collapse of a $8 billion hedge fund named Aramanth.

"His Positions were so big he could cause the price to move in the way he wanted by buying or selling massive amounts of his holdings in the last 30 minutes of trading on NYMEX, a move known as 'smashing the close,' federal regulators say."

--Energy Traders Avoid Scrutiny
Washington Post
By David Cho
10/21/07

Chart prepared by:
Office of Sen. Dorgan

Permanent Subcommittee on Investigations
EXHIBIT #18

COAL TECH CORP
P. 0. Box 154, Merion Station. PA 19066-0154
Tel. (610) 667-0442, Fax (610)-667-0576
E-mail: bz.coaltech@verizon.net Internet: www.coaltech.biz

December 11, 2007

U.S Senate **Energy and Natural Resources Committee**
304 Dirksen Senate Building
Washington, DC 20510
Tel. (202) 224-4971, Fax:((202)-224-6163

SUBJECT: IMPORTANT OIL & GAS DATA FOR TODAY'S HEARING

Dear Senators:

I just read that you are holding Hearings today on the "Price of Oil". You might be interested in the following extract from letters that I wrote to my Congressman Gerlach and Senator Santorum on the relation of the price of oil to Iraq in October 2006. I concluded that oil prices could be driven by hedge fund speculation.

"The first step is to identify the cause for the sharp increase in the price of oil and natural gas, which I deduced from U.S. Department of Energy (DOE) data on production and prices.

--Figure 1 shows DOE's data on the World's annual percentage increase in oil production and price since 1990. From 1990 to 1999, oil production increased by about 15%, yet prices actually declined in most years and averaged $20 per barrel. But then from 1999 to 2006, while production increased by only 12%, **prices tripled by 300%, namely to $60 per barrel!**

--Figure 2 shows that from 1990 to 2006, US natural gas consumption was **about flat.** Prices were constant (at $2 per 1000 cubic feet) from 1990 to 1999. But then from 1999 to 2005, **the price of natural gas has quadrupled to $7.5 per 1000 C.F.**

The huge divergence between supply and prices in the past few years suggests it was driven primarily by financial factors, not supply and demand. The 3000 unregulated hedge funds with $1 trillion in assets have the financial clout and the means to drive energy prices sharply higher. For examples, in 1998, hedge fund, Long-Term Capital Management over-leveraged its $5 billion in assets to $120 billion and went bust and nearly caused a worldwide financial panic. In September 2006, a hedge fund, Amaranth Advisors, went bust after **losing about $5 billion** in natural gas futures in a few weeks as **gas prices collapsed by two-thirds from $15 to $5 per million Btu.** This huge price swing was clearly **not** a "supply" problem.

Yet the Wall Street Journal does not want to "*give jurisdiction over the hedge funds to the SEC and its army of 27-year old lawyers*" (WSJ, ed. 10/31/2006) presumably to prevent them from uncovering manipulation. Before the 1930's, there was no SEC, and the stock market was leveraged 10 to 1 before collapsing in the 1929 crash.

Therefore, you wish to investigate what role, if any, hedge funds played in the run-up, and wild swings, of oil and gas prices. "

Sincerely,
Bert Zauderer
Dr. Bert Zauderer, Sc.D.

Permanent Subcommittee on Investigations
EXHIBIT #19

FIGURE 1: Percent Increase in World Oil Production & Oil Prices from 1990 to 2006

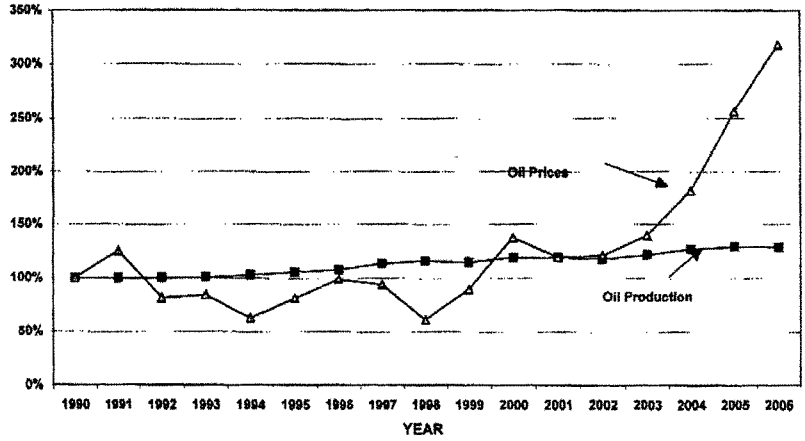
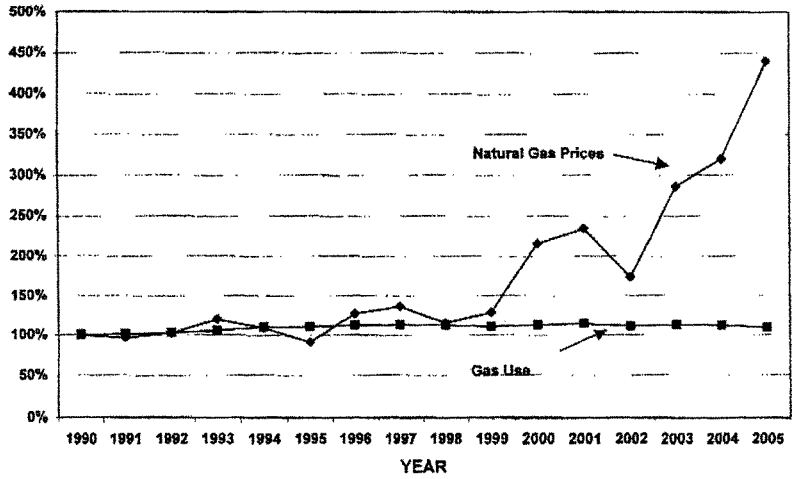


FIGURE 2: Percent Increase in USA Natural Gas Use & Prices from 1990 to 2005



COAL TECH CORP,
Merion, PA

Source: US Dept of Energy

COMMITTEE: SENATE PERMANENT SUBCOMMITEE ON INVESTIGATIONS
SUBCOMMITEE ON ENERGY

HEARING DATE: DECEMBER 11, 2007

WITNESS: GUY CARUSO

INSERT FOR THE RECORD

The ratio of sweet and sour crudes stored in the Strategic Petroleum Reserve was established to meet the needs of the U.S. refining industry, particular those of Petroleum Administration for Defense Districts (PADD) II and III. Non-Canadian crude imports to the U.S. are roughly 26% sweet and 74% sour. Crude oil stored in the SPR is currently 39% sweet and 61% sour. The reason for having slightly more sweet crude oil in the SPR than is imported is because nearly all sour refiners can process light sweet crude oil if their normal supply is disrupted, even if they must do so at a reduced rate. The same cannot be said for light sweet refineries processing sour crude. If a light sweet crude oil refinery were to run sour crude oil, they would be in violation of environmental regulations and could potentially degrade their refinery equipment, exacerbating the effects of a supply disruption. Furthermore, the refinement of light, sweet crude oil produces large volumes of high value products such as gasoline and diesel. The SPR's current storage of sweet crude ensures that in the event of a supply disruption, refiners can process SPR crude oil and continue to supply these highly critical products. Finally, the current mix allows the SPR to serve nearly all US refiners. Storing only sour crude might limit the SPR to service only 75% of the US refining industry. Reducing the percentage of sweet crude in SPR storage would decrease the effectiveness of the SPR in protecting America's energy security in the event of an oil supply disruption.

Permanent Subcommittee on Investigations
EXHIBIT #20a

COMMITTEE: SENATE PERMANENT SUBCOMMITEE ON INVESTIGATIONS
SUBCOMMITEE ON ENERGY

HEARING DATE: DECEMBER 11, 2007

WITNESS: GUY CARUSO

INSERT FOR THE RECORD

The procedures that are followed by the SPR for the acquisition of crude oil were published as a Final Rule on November 8, 2006, after completing a public involvement process, and are codified as 10 CFR Part 626. The regulations were promulgated at the direction of Congress in Section 301(e) of the Energy Policy Act of 2005.

As required by Act, the procedures were developed to take into account the need to:

1. Maximize overall domestic supply of crude oil.
2. Avoid incurring excessive cost or appreciably affecting the price of petroleum products.
3. Minimize the costs to the Department of the Interior and the Department of Energy in acquiring such petroleum products.
4. Protect national security.
5. Avoid adversely affecting current and futures prices, supplies, and inventories of oil; and,
6. Address other factors the Secretary determines to be appropriate.

The Department of Energy is currently filling the SPR through the royalty-in-kind (RIK) exchange program with the Department of the Interior. Given Federal Government procurement regulations and current crude oil market conditions, using this method, which is a transfer of a

Permanent Subcommittee on Investigations
EXHIBIT #20b

Government asset from one agency to another rather than a direct purchase, ensures that the acquisition of crude oil is done in a cost efficient manner.

Transfer of oil to the SPR under the RIK exchange program delays revenues to the U.S. Treasury until such time as the SPR is drawn down and sold.

All Department of Energy crude oil acquisition activities for the SPR are competitive, transparent and market-based, and the modest fill rate of one-tenth of one percent of global consumption has a negligible effect on price.

Department of Energy
Washington, DC 20585

February 21, 2008

The Honorable Carl Levin
Chairman
Permanent Subcommittee on Investigations
Committee on Homeland Security and Governmental Affairs
United States Senate
Washington, DC 20510

Dear Mr. Chairman:

On December 11, 2007, Guy F. Caruso, Administrator, Energy Information Administration, testified regarding crude oil prices.

Enclosed are the answers to eight questions submitted by the Subcommittee and Senators Domenici and Murkowski. The remaining answers are being prepared and will be forwarded to you as soon as possible.

If we can be of further assistance, please have your staff contact our Congressional Hearing Coordinator, Lillian Owen, at (202) 586-2031.

Sincerely,

Lisa E. Epifani
Assistant Secretary
Congressional and Intergovernmental Affairs

Enclosures

cc: Honorable Byron Dorgan

Permanent Subcommittee on Investigations
EXHIBIT #21

Department of Energy
Washington, DC 20585

May 13, 2008

The Honorable Carl Levin
Chairman
Permanent Subcommittee on Investigations
Committee on Homeland Security and Governmental Affairs
United States Senate
Washington, DC 20510

Dear Mr. Chairman:

On December 11, 2007, Guy F. Caruso, Administrator, Energy Information Administration, testified regarding crude oil prices.

Enclosed are the answers to two questions submitted by Senators Domenici and Murkowski to complete the hearing record.

If we can be of further assistance, please have your staff contact our Congressional Hearing Coordinator, Lillian Owen, at (202) 586-2031.

Sincerely,

Lisa E. Epifani
Assistant Secretary
Congressional and Intergovernmental Affairs

Enclosures

Printed with soy ink on recycled paper

QUESTION FROM THE PERMANENT SUBCOMMITTEE ON INVESTIGATONS

Q1. The EIA's weekly reports on petroleum prices include traditional supply and demand data, as well as discussion of the trends in that data, but do not present any market data that is compiled and published by the Commodity Futures Trading Commission (CFTC) on the amount and type of speculative positions in the oil market, or any discussion or analysis of trends in the CFTC data, such as whether for the previous week there was a net increase or net decrease in long or short positions by speculators. Has EIA considered adding a summary presentation of such data or an analysis of such trends in market speculation as a permanent feature of its weekly reports? Wouldn't the inclusion of such data and analysis provide a more complete snapshot of the most recent trends in the petroleum and petroleum product markets?

A1. EIA is always interested in enhancing the information we provide on our website. We agree that reporting on financial flows could add insight and we occasionally discuss shifts in such flows, along with changes in supply and demand balances, in EIA's weekly analysis report, "This Week in Petroleum." However, to provide such discussion on a routine basis would require resources to modify EIA's weekly data publication system as well as to conduct frequent, in-depth financial analyses, that might have limited value over and above comparable information that is already available elsewhere. Although the option of enhanced reporting on futures market conditions merits careful consideration, we are currently focusing our limited resources on improving our coverage and measurement of physical petroleum market movements in a rapidly changing and volatile economic environment.

QUESTION FROM SENATOR DOMENICI

Q1. Is energy independence a realistic concept for the United States, and if so, is it a realizable objective for our energy policy?

A1. Energy independence for the U.S. economy is a realistic concept however it will take time to achieve. Our dependence on petroleum fuels, particularly for transportation, coupled with historically declining domestic oil production, combine to make near-term energy independence harder to realize.

Increased and efficient utilization of domestic coal, natural gas, nuclear power and renewable resources make the concept of energy independence a possibility, especially if substantial amounts of transportation demand could be shifted from petroleum fuels to coal and nuclear-based electric power, or to liquid fuels derived from domestic sources, such as biofuels. This long-term fuel shift is the focus of Administration technology initiatives, such as plug-in electric hybrid vehicles, cellulosic ethanol, clean coal initiatives, carbon sequestration and storage development to permit wider use of domestic coal, and the President's Twenty in Ten plan to increase the efficiency of cars and light trucks and meet a larger share of fuel demand from alternative and renewable fuels.

The December 2007 enactment of the Energy Independence and Security Act is another significant step in the right direction. EISA increases CAFE requirements, encourages increased production of biofuels, improves standards for appliances and lighting and promotes energy savings in buildings and industry and government and public institutions, among other provisions.

QUESTION FROM SENATOR DOMENICI

Q2. How much of our domestic oil resources are off limits to exploration and development? And if these resources were opened to development, what difference would it make on the supply and demand for oil, and price of oil in the U.S.?

A2. Approximately 32 billion barrels (18 percent) of total estimated technically-recoverable crude oil resources in the United States are currently unavailable for exploration and development because Federal statutes or administrative decrees limit access. EIA estimates that opening these areas to oil exploration and production would gradually increase U.S. production above expected levels. By 2030, the incremental production would be nearly 1 million barrels per day (17 percent). Between now and 2030 the cumulative increase in domestic production would be over 3 billion barrels (7 percent). The increase in U.S. oil production from opening access to these restricted areas would have no effect on oil prices in the near term, but would be expected to lower world oil prices by about $0.90 per barrel by 2030 (2006 dollars). The impact on domestic oil consumption from this lower price is expected to be minimal, with a cumulative increase through 2030 of under 0.5 billion barrels (0.2 percent). We estimate that the increase in domestic oil production would lower U.S. dependence on imported crude oil and petroleum products in 2030 from 59 percent to 55 percent.

BACKGROUND

The Minerals Management Service estimates that 19 billion barrels of technically recoverable crude oil resources are located in offshore areas under Federal leasing moratoria in the Atlantic, the Pacific, the Eastern Gulf of Mexico, and the North Aleutian Basin. The United States Geological Survey estimates that 10 billion

barrels of crude oil resources are located in the Arctic National Wildlife Refuge (ANWR), which is also under a Federal leasing moratorium. Another 2 billion barrels of crude oil, according to the USGS, are located in state waters where oil and gas drilling is prohibited by statute or administrative decree. With respect to accessibility in the onshore Lower-48 states, Advanced Resources International (ARI), a private contractor, conducted a study for the Energy Information Administration based on the results of both the National Petroleum Council's 2003 report *Balancing Natural Gas Policy – Fueling the Demands of a Growing Economy* and the 2002 Federal interagency report *Scientific Inventory of Onshore Federal Lands' Oil and Gas Resources and Reserves and the Extent and Nature of Restrictions or Impediments to Their Development*. ARI estimates that 1 billion barrels of crude oil resources are officially inaccessible in Lower-48 onshore areas where leasing and/or surface occupancy is prohibited by Federal statutes or administrative decrees.

QUESTION FROM SENATOR DOMENICI

Q3. Please quantify the role of speculators in the market?

A3. The effect of speculation in commodity markets is a longstanding and vexing issue, and one that is not easily quantified. EIA has examined this issue extensively, including the application of econometric and statistical techniques, as part of its ongoing efforts to monitor and analyze the operation of the oil market. The results of these efforts indicate that almost all of the upward trend in oil prices in recent years can be explained by supply and demand fundamentals, including: strong world economic growth driving an increase in consumption, moderate non-Organization of the Petroleum Exporting Countries' (OPEC) supply growth, OPEC members' production decisions, low OPEC spare production capacity, tightness in global commercial inventories, worldwide refining bottlenecks, and ongoing geopolitical risks and concerns about supply availability.

In addition to conducting it's own analysis of the explanatory factors for oil prices, EIA has also carefully reviewed studies that focus directly on the role of speculation, including studies by the Commodity Futures Trading Commission (CFTC), the International Monetary Fund, other financial institutions, and academic experts. Those studies generally conclude that speculation does not appear to be a significant driver of oil prices, a result consistent with our own analyses of key price determinants.

Much discussion of this issue has been prompted by the observation that non-commercial participation in the crude oil futures market is higher when oil prices are rising, and some analysts even draw a causal relationship between the former and the latter. However, by far the most extensive analysis of this kind has been performed by staff of the CFTC. CFTC economists, using a detailed set of position-level trading data not available elsewhere, have analyzed the behavior of managed money traders (MMTs) in relation to other market participants and found both that MMTs are more prone to follow than to lead position changes by others and that MMT position changes had a statistically significant inverse relationship to price changes in the crude oil market.

There have been many instances over the past few years in which crude oil futures prices have increased, along with an increase in the net long (that is, more buyers than sellers) positions of non-commercial participants--of course implying a counterbalancing increase in commercial participants' net short positions during these periods. This pattern seems to have held most of the time since 2005. However, there have been key periods in which the net position of non-commercial participants did not move in the same direction as prices. For example, while the average price remained around $95 per barrel over the first part of November 2007, net long positions varied dramatically. Additionally, net long positions were significantly higher in July 2007, even with oil prices more than $20 per barrel lower than they were in November. Thus, any apparent correlation between rising speculative activity and rising prices is a loose one at

best. The available evidence, reinforced by the CFTC's June 2006 study, suggests that speculators shift positions in response to price changes. In particular, should the tight supply and demand conditions weaken or be expected to soften, speculative activity (i.e., long positions) would likely decline, as has been seen very recently.

In summary, speculators and others appear to have moved towards investing in oil markets because of tight fundamentals. In other words, high oil prices seem to be increasing participation by non-commercial traders, rather than the other way around.

QUESTION FROM SENATOR DOMENICI

Q4. During the hearing it was suggested that we should make the ownership of crude oil inventory available to the public. Would such an action have any impact on the relationship between the U.S. energy industry and the U.S. government?

A4. As noted in the question, during the hearing there was a discussion of making company-level data on the ownership of crude oil inventory available to the public. There are several factors involved in consideration of this issue.

First, the EIA currently collects crude oil inventory data on a custody basis, not on an ownership basis. There is not a one-to-one relationship between ownership and custody, so the present data do not provide a basis for reporting ownership information in either an aggregate or disaggregate form.

Second, data on inventories are currently reported to EIA with the understanding that they are commercial data that is considered as privileged or confidential by the reporting companies. Public release of company-level inventory data, especially over time, could provide a source of intelligence about the reporting companies, their operating strategies and their capabilities. The disclosure of company-level data to competitors and suppliers could therefore cause substantial competitive harm to the reporting companies. For this reason, public reporting of company-level data could jeopardize the government's on-going capability to collect, analyze, and disseminate high quality energy information by undermining a company's willingness to participate in future EIA statistical surveys.

Third, reporting of inventory custody data on a company-level basis could inadvertently place a disproportionate competitive burden on inventory holders who operate one facility or a small number of facilities, since public reports of their company-level inventories would implicitly convey more specific information about their capacity and operations in particular locations.

The desirability of public reporting of company-level inventory ownership data ultimately depends on weighing the potential benefits against the potential costs. As outlined above, there appear to be significant potential costs, above and beyond the fact that EIA does not now even collect inventory data on an ownership basis. Since we are unaware of any clear argument regarding the benefits of public reporting of company-level inventory data that would offset the apparent costs and risks discussed above, EIA believes that its present practice of reporting inventory information on an aggregate, regional basis best serves the public interest.

QUESTION FROM SENATOR MURKOWSKI

Q1. EIA estimates that OECD commercial inventories will decline below the 5-year average at the end of 2007, and then continue to decline going forward. Why, just one year ago in 2006, were inventory levels above the 5-year average, and why will inventories continue to decline?

A1. The combination of relatively slow world oil consumption growth and rising OPEC production caused a build in global oil inventories during the second and third quarters of 2006. Inventories were also built as insurance against possible supply disruptions. (After Hurricane Katrina shut off over a million barrels per day of oil production in the Gulf of Mexico in 2005, market participants responded by building oil inventories in advance of the 2006 hurricane season.) As a result, OECD commercial oil inventories were 150 million barrels above their 5-year average at the end of September 2006. However, large-scale hurricane damage did not occur in 2006, and with no other new supply losses to offset the inventory build, oil markets were left with higher-than-expected commercial inventory levels, which contributed to a decline in oil prices.

Facing rising OECD inventories and relatively weak prices late in 2006, OPEC announced plans to cut production in November 2006 and February 2007 by 1.2 and 0.5 million barrels per day, respectively. Although OPEC members' actual production cuts were about half of the planned amounts, the cuts reversed the slide in world oil prices and, along with continued global demand growth, resulted in an inventory drawdown.

OPEC members' production decisions have played a critical role in determining price trends. In response to the recent rise in oil prices to over $90 per barrel, OPEC announced that it would reverse some of its production cuts, and raise production by 0.5 million barrels per day beginning in November 2007. However, it is unlikely that these higher volumes will be enough to halt the downward trend in commercial inventories over the next several months, given EIA's outlook for continued rising global oil consumption and moderate non-OPEC production growth. The latest data available to EIA estimates that OECD commercial stocks were just below their 5-year average at the end of 2007. Even with the additional OPEC production expected in 2008, OECD commercial inventories (measured on a days-supply basis) would remain in the low end of the 5-year range in 2008.

QUESTION FROM SENATOR MURKOWSKI

Q2. At various times over the past 5 years, high oil prices have been linked to downstream conditions, specifically limited refinery capacity in the United States. Is this limited capacity a continuing factor in the determination of crude oil prices?

A2. The main reason behind high oil prices is tight crude oil production capacity in the face of rising world petroleum demand, though other factors also are affecting prices. With little or no excess crude oil production capacity, and no expectation for substantial improvement in the next several years, high oil prices are expected to continue.

Since 2006, refining margins have also been correlated with crude prices. This correlation, in conjunction with higher world refinery capacity utilizations since 2004, has led to interest in the role refining capacity may play in higher oil prices. In the longer term, however, world or U.S. refining capacity utilization has not correlated strongly with crude oil prices or with refinery profit margins. In fact, in the United States, capacity utilization has been high since the late 1990's, well before recent sharp increases in crude prices.

There is likely some connection, however, between crude prices and spare refinery capacity. When spare refining capacity is limited, refiners' flexibility to adapt to unpredictable changes in demand and even supply is limited. This can add to product market tightness since refinery responses can be slower than when more spare capacity is available. But even with more spare capacity, demand pull from areas like China and India will continue to put pressure on petroleum

supply and thus crude oil prices. Tight product markets in the last few years, especially in the Atlantic Basin, also have helped to support crude price increases. While refinery capacity utilization in the United States has not been as high as it was in 1997 and 1998, the Rita/Katrina hurricane damage in 2005 and subsequent high maintenance outages tightened U.S. petroleum product markets considerably, pushing product margins to very high levels. Tight U.S gasoline markets have supported product margins in Europe, as the U.S. imports most of the excess European gasoline production. Lower expected outage levels for U.S. refiners in 2008 and higher ethanol volumes should moderate U.S. gasoline market tightness, and refinery expansion projects that are expected to come on stream in 2009 will increase spare refinery capacity in the Atlantic Basin.

In summary, while refining capacity, like many other factors, may have played a role in higher prices, it has not been the major driver behind high crude oil prices.

QUESTION FROM SENATOR MURKOWSKI

Q3. Over the last decade, has the demand for refined products surpassed our refining capacity? If so, by how much, and why?

A3. Yes, demand has surpassed our refining capacity. The market for gasoline in the Northeast is particularly noteworthy in this regard. The United States has taken advantage of economic gasoline imports since the late 1950s. But in the last twenty years, those import volumes have grown substantially. In 2006, imports of gasoline blending components and finished product supplied over 12 percent of U.S. demand, versus about 6 percent of demand in 1996. Volumes of total gasoline imports more than doubled during this period, to average about 1.1 million barrels per day in 2005 and 2006.

The largest part of the growth in imports during the past decade has come from Western Europe, which accounted for almost 48 percent of the increase in imports between 1995 and 2005. (The hurricanes at the end of 2005 resulted in even more volumes from Europe in 2006.) Europe has an excess of gasoline production as a result of its moving from gasoline-fueled vehicles to diesel-fueled in order to help reduce energy consumption. (Diesel engines are more efficient than gasoline engines.) The switch has resulted in gasoline demand in Western Europe declining on average 92,000 barrels per day each year from 2002 to 2006, based on data from the International Energy Agency. Diesel demand has increased annually by about the same amount during that period.

Because of the characteristics of the processing units in place, European refineries have not been able to completely shift their production with the demand shift from gasoline to diesel fuel. European refineries have been maximizing their diesel output, but they still produce more gasoline than can be used in that region. Those excess gasoline volumes have found a growing market in the United States.

Having economic, growing supplies of product available for import discourages expanding capacity in the United States The Gulf Coast is the main area for U.S. refinery expansion for a variety of reasons, including its port access for crude imports and pipeline access for shipping product into the Midwest as well as the East Coast.

Regarding diesel fuel, the United States produces most of its own distillate (heating oil and diesel), but does depend on imports of heating oil to the Northeast during the winter. Since 2000, monthly distillate imports during the winter have peaked at over 500 thousand barrels per day a number of times. Winter imports can represent well over 10 percent of U.S. distillate demand in a peak month. Distillate imports come mainly from Canada and the Virgin Islands, which accounted for about 60 percent of the distillate imports in 2005 and 2006. These refineries mainly serve the U.S. market. Western and Eastern Europe accounted for another 15 percent of distillate imports. Europe is the region that frequently provides surge imports to meet unexpected demand during the winter months.

QUESTION FROM SENATOR MURKOWSKI

Q4. Is there any policy that the U.S. government might adopt that would lead to increased refinery capacity investment in the United States?

A4. The Federal Government does not play an explicit role in the expansion of mature and competitive industries. The Department of Energy has no regulatory role in connection with the construction of new refineries or the expansion of existing facilities. The Environmental Protection Agency has regulatory authority in connection with environmental issues.

The Federal Government can, however, improve processes where appropriate, cost-effective, and efficient. For instance, Sections 391 and 392 of the Energy Policy Act of 2005 provide for better coordination and assistance in the Federal and State regulatory review process. Additionally, Title XVII of EPACT05 authorizes loan guarantees for the use of new or innovative technologies at refineries and Section 1323 of EPACT05 allows expensing of a portion of new refining capacity.

QUESTION FROM SENATOR MURKOWSKI

Q5. What purpose does the Strategic Petroleum Reserve play?

A5. According to Section 161 of the 1975 Energy Policy and Conservation Act, the purpose of the Strategic Petroleum Reserve (SPR) is to provide crude oil to refineries, at the discretion of the President, in the event of a "severe energy supply interruption" or to fulfill "obligations of the United States under the international energy program." Additionally, the SPR program provides tracking and analysis of U.S. petroleum refineries regarding their crude processing capabilities and operations to ensure that the Reserve's crude compatibility and distribution capabilities are sufficient to satisfy U.S. refiner demands in the event of a crude supply interruption.

RESPONSES TO SUPPLEMENTAL QUESTIONS FOR THE RECORD
for

FADEL GHEIT

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JOINT HEARING OF THE
PERMANENT SUBCOMMITTEE ON INVESTIGATIONS
AND
SUBCOMMITTEE ON ENERGY
HEARING ON
SPECULATION IN THE CRUDE OIL MARKET

QUESTIONS FROM THE PERMANENT SUBCOMMITTEE ON INVESTIGATIONS:

1. To the best of your knowledge, is the increase in speculation that we've seen over the past few years biased towards one side of the market or the other, in other words towards long or short positions, and, if so, what is the significance of that bias?

   ANSWER: Although oil prices have been mostly in an upward trend in the last five years, the long open interests positions were slightly higher than the short positions. The rise in oil prices usually forces short sellers to buy back their positions, cover their shorts, to avert further losses. This usually exacerbates the upward move in oil prices, as was often the case during the last few years, especially last year.

2. What has been the effect of commodity index funds on crude oil futures prices? Have these funds added an upward pressure on prices or increased price volatility?

   ANSWER: Commodity index funds have become increasingly popular in recent years with the rise in commodity prices, which are considered a hedge against rising inflation. These funds, which have become an asset class, are marketed to potential buyers as an alternative investment. Commodity index funds have attracted not only hedge funds, but also a large number of pension funds and insurance companies. Increased demand for such funds by investors was a contributing factor to the rise in oil prices as well as the increase in price volatility.

Permanent Subcommittee on Investigations
EXHIBIT #22

3. Does the DOE's placement of crude oil in a backwardated market affect U.S. crude oil inventories? If so, how and to what extent? Does the DOE's placement of sweet crude oil in a backwardated market affect PADD 2 inventories or inventories at Cushing, Oklahoma? If so, how and to what extent?

   ANSWER: The volume of crude oil purchased by the DOE is relatively small compared with US total production, consumption and imports. However, in a tight crude oil market, which prevailed in the last three years, the impact can be more significant, since every barrel counts. But, more importantly, however, such purchases can raise concerns about supply security and send the wrong message to the crude oil market. Unfortunately the impact is difficult to measure because of the many other factors that are simultaneously at play. These factors include: refinery and pipeline outages, geopolitical developments, economic activity, severe weather, and the health of the financial markets.

4. DOE states that the SPR fill has a negligible effect on prices because the amount of crude oil placed into the SPR is small compared to total global demand and supply. Do you agree with this position? When evaluating the impact of the volumes of crude oil placed in the SPR, is total global supply and demand the appropriate point of reference or denominator?

   ANSWER: SPR fill may be negligible in terms of volume, in comparison to world oil supply or demand and our own oil production, consumption or imports, but it is a contributing factor in the rise in oil prices. This action sends the wrong message to the world oil market indicating rising US concerns about security of supply and worry about potential disruptions and possible oil shortage. Filling the SPR during periods of tight supply, strong demand, and high prices, especially in a backwardated market, has contributed to the sharp rise in oil prices. The SPR fill should be done opportunistically during periods of excess supply. We should consider selling small amounts of crude oil from the SPR on occasions to ease market tightness. The government willingness to use the SPR as a safety valve could reduce speculation and help restore market confidence.

QUESTIONS FROM SENATOR DOMENICI:

1. Is there any benefit to the market for allowing non-commercials (speculators) to participate in the trading of oil contracts?

   ANSWER: Although non-commercial traders bring additional liquidity to the oil markets, they also bring volatility and speculation. They often distort market fundamentals by exaggerating the potential impact of short-term events on future oil prices. On balance, speculators do more harm than good and the oil

markets may be better off without them. Many large financial players, mostly investment banks, are considered commercial, which should be disallowed. A few months ago the Indian government suspended oil trading by non-commercials to restore order to the overheated local oil market, which was thrown in turmoil as a result of excessive speculation.

2. What would happen to the price of oil if non-commercials were not allowed to participate in the market?

   ANSWER: Banning non-commercials from oil trading would significantly reduce volume, volatility and speculation. Linking trading volume to physical volume by commercials could also help restore stability and align oil prices more closely with market fundamentals. This would also blunt the impact of the weekly petroleum data released by the DOE, which speculators regularly use to manipulate oil prices.

3. Can you define market liquidity? Do non-commercials add liquidity to the market?

   ANSWER: Liquidity is when there are enough buyers and sellers to accurately reflect market fundamentals of supply and demand, taking into account all risk factors. While non-commercials add liquidity to the crude oil market, they also increase trading volume above global consumption and cause price volatility, all of which often distort market fundamentals. The primary goal of commercial traders is to offset potential market risk, not necessarily to make a profit, while the main goal of speculators is to maximize profit by assuming higher risk.

4. What is the relationship between short-term and long-term prices?

   ANSWER: Short-term prices are leading indicators to long-term prices. The oil markets are usually expected to be in contango, where future prices are higher than current prices to account for the time value money. However, during periods of excessive speculation, which are currently prevailing, the oil markets are backwardated. Contango is the norm, while backwardation is the exception.

QUESTIONS FROM SENATOR MURKOWSKI:

1. How do you define speculation? And, is there a difference between your definition and "fear speculation"?

   ANSWER: Speculation is the anticipation of a certain outcome in response to a certain action based on incomplete, inaccurate, or misleading information that cannot be supported entirely by facts. Speculation is based on risk, or fear, assessment that is more of a perception than reality. Declining petroleum inventories increase the risk, or fear, of potential shortages, which may or may not materialize. Speculation is a high-risk, high return, which is more suitable for financial players than commercial traders.

QUESTIONS FROM SENATOR PRYOR:

1. The sharp increases and extreme volatility of oil prices suggest that some part of the rise in oil prices is due to speculation by non-commercial investors. What indicators can regulators use to detect speculation?

   ANSWER: There are several indicators that reflect the growing role of speculators in the rise in oil prices. These include; average trading volume by type of energy commodity, number of participants, hourly, daily, weekly, and monthly trade patterns, long and short hedge positions, size and number of trades. The large investment banks market oil futures as an alternative investment, a new asset class, which can be a hedge against inflation and weak dollar against major currencies.

2. What do you think is the likelihood that current high oil prices will self-correct? If speculation is a factor in prices, will the bubble eventually burst as did the dot com and housing bubbles?

   ANSWER: It is likely that the current oil price bubble will eventually burst, as the market self-corrects as supply concerns ease or demand growth cools off, although I cannot predict when, how, and by how much oil price will decline. Commodity price bubbles, especially for necessities, can have serious economic and social implications. Because of the critical role oil plays in our economy and its importance to our national security, I believe the crude oil markets must be regulated.

3. Given that the oil market is international in scope and extremely interconnected, do you think regulation of financial players in the United States would have a noticeable impact on oil prices?

ANSWER: In order to reduce, or eliminate, speculation, there must be coordinated government efforts by major producing and consuming countries to regulate the crude oil market. Self-regulation does not work. Regulating the financial players in the US could reduce speculation and would be a first step in the right direction. However, the international scope of the crude market makes it possible for the financial players to conduct their trading in another unregulated market.

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RESPONSES TO SUPPLEMENTAL QUESTIONS FOR THE RECORD
for

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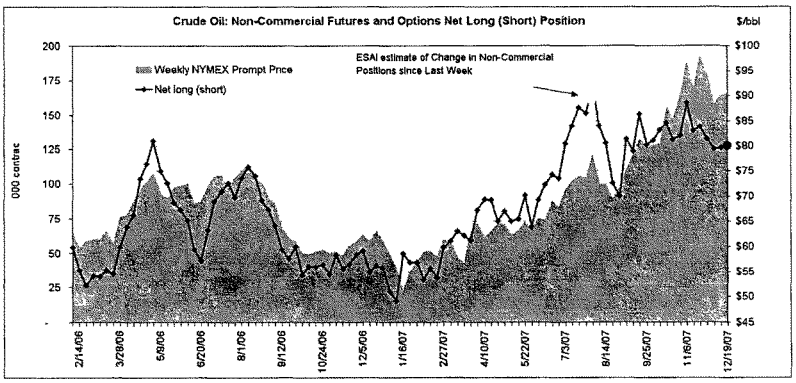
JOINT HEARING OF THE
PERMANENT SUBCOMMITTEE ON INVESTIGATIONS
AND
SUBCOMMITTEE ON ENERGY
HEARING ON
SPECULATION IN THE CRUDE OIL MARKET

QUESTIONS FROM THE PERMANENT SUBCOMMITTEE ON INVESTIGATIONS:

1. *To the best of your knowledge, is the increase in speculation that we've seen over the past few years biased towards one side of the market or the other, in other words towards long or short positions, and, if so, what is the significance of that bias?*

- There has been an increase in the number of "non-commercials" (the CFTC term for non-hedgers) trading in the New York Mercantile Exchanges's Crude Oil contract. The chart below – from ESAI – shows the net (long minus short) position of the non-commercials in 2006 and 2007. They have had a net long position in both years. I believe that tends to put upward pressure on prices.



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2. *What has been the effect of commodity index funds on crude oil futures prices? Have these funds added an upward pressure on prices or increased price volatility?*

- Anecdotal evidence suggest index funds have increased their exposure to oil markets. To the extent the fund is indexed on the side of inflation hedges, the fund would tend to take a long position in oil. That increase in long positions would tend to add upward pressure on oil prices.

3. *Does the DOE's placement of crude oil in a backwardized market affect U.S. crude oil inventories? If so, how and to what extent? Does the DOE's placement of sweet crude oil in a backwardized market affect PADD 2 inventories or inventories at Cushing, Oklahoma? If so, how and to what extent?*

- By definition, "placement of crude oil" (assuming this refers to storage in the SPR) increases crude oil inventories. I do not believe that this directly affects the level of commercial inventories in Cushing. Backwardized price structures generally discourage the accumulation of inventories.

4. *DOE states that the SPR fill has a negligible effect on prices because the amount of crude oil placed into the SPR is small compared to total global demand and supply. Do you agree with this position?*

- Yes.
    a. When evaluating the impact of the volumes of crude oil placed in the SPR, is total global supply and demand the appropriate point of reference or denominator?
        - Yes

QUESTIONS FROM SENATOR DOMENICI:

5. *How much of an impact does the International Commodities Exchange (ICE) have on the price of oil?*

- ICE is a forum in which a number of Exempt Commercial Market exist for buying and selling oil. As such, each ICE contract has its own market, with distinctive depth and liquidity. There is not enough information to determine if crude oil trading on ICE, as distinct from trading on the NYMEX, has any impact on crude oil prices.

6. *Does ICE report any of its trading to the Commodities Future Trading Commission?*

- It is my understanding that the CFTC Commission staff has issued several special calls to the Intercontinental Exchange requesting information on trader positions in ICE natural gas contracts that are directly linked to NYMEX futures prices.

7. *Is Over-the-Counter trading subject to regulations or provisions of the Commercial Exchange Act?*

- As noted by the CFTC, the Commodity Futures Modernization Act of 2000 (CFMA) included a provision to create a new trading facility known as an Exempt Commercial Market (ECM). ECMs are not "registered with, or designated, recognized, licensed or approved by the Commission." ECMs, as well as transactions executed on ECMs, are statutorily exempt from most provisions of the CEA. Trading on an ECM is not subject to regular, ongoing market surveillance oversight by the Commission. The CFTC does retain fraud and manipulation authority over ECMs.

    a. In your view, does this Act need to be clarified, or otherwise modified, to enhance transparency of trading of oil contracts?
        - Yes. I believe most contracts trading on ECMs should be subject to similar disclosure requirements imposed on non-exempt markets.

8. *Can you quantify the number of commercial versus non-commercial investments in the trading of oil contracts?*

- On average, what the CFTC defines as commercials constitute 71 percent of total open interest in the crude oil contract on the NYMEX; non commercials constitute 7 percent; non-reporting entities (could be either) 29 percent.

9. *What are the average daily volumes on NYMEX for WTI, and Brent contracts on the ICE?*

- ICE reported in January 2008 that WTI Crude futures achieved record daily volume of 385,502 on November 29; and ICE WTI Crude futures established an open interest record on November 8 of 649,982 contracts. I do not know the average daily volumes for WTI and Brent contracts on ICE.

10. *Can you explain the difference between backwardation and contango in the futures market, and what effects these principles have on crude oil prices?*

- Contango is the condition in which the prompt months prices of a futures contract are lower than the prices for the same contract in subsequent months. Backwardation is the reverse. These are themselves pricing structures, and the effects of such price *structures* on prices is

unclear, and depends on which price is the subject of interest (the prompt price? Or longer dated prices? Or the average "strip" of prices?).

- Contango and backwardation are believed to influence subsequent prices through the storage mechanism. In a contango market, a trader may buy physical oil at a lower price and sell it at a higher price, with little risk. Whether it pays to do so depends on the cost of storage, and the cost of financing the physical purchase of oil. If it costs $100 to buy a barrel of oil, and the interest rate is 10%, and the cost of storage is $10 per year, then it would pay to buy oil in a contango market for sale a year later only if the 12th month price at the time of purchase was at least $120/barrel.

QUESTIONS FROM SENATOR MURKOWSKI:

11. In your testimony, you discuss that when crude oil prices reach $1 00 per barrel, this could reflect "classic commodity bubbles." Could you explain what you mean by a classic commodity bubble is?

- Over the course of centuries, there have been hundreds of periods during which it became fashionable to invest in a given asset (sometimes commodities, sometimes equities, sometimes real estate or currency). I refer simply to a period in which investors divert funds into a particular asset class. For a recent book on how far back this phenomenon goes, see (*inter alia)* Peter M. Garber, *Famous First Bubbles: The Fundamentals of Early Manias*. For a more recent analysis of how leverage, derivatives and other financial innovations might be affecting prices, see Richard Bookstaber, *A Demon of Our Own Design: Markets, Hedge Funds and the Perils of Financial Innovation.*

12. Is there any benefit to the market for allowing non-commercials (speculators) to participate? Do they lead or do they follow?

- Speculators are critical to the success of any market. Speculators sometimes have sufficiently large positions to obtain market power, whereupon they may distort market prices. The United States has a substantial body of opinion and law related to these matters.

13. Does the trading of oil derivatives benefit the American consumer, and if so, how?

- The evolution of oil derivatives is part of a much larger development of innovative financial instruments since the 1970s. I believe that, by and large, these instruments have been very good for American consumers. They have enabled American businesses and consumers to transfer risk to specialized entities – speculators – who should be organized to handle the risks of their speculation. In the absence of derivatives, there would be fewer ways to transfer these risks, to the ultimate detriment of the consumers and the economy.

14. In your testimony, you discuss regulatory implications - what regulatory policies need to be implemented to assure the competitive workings of energy derivative markets, including those that are not regulated under the Commodities Exchange Act?

- I believe that the disclosure requirements that have been imposed for decades on the traditional commodity exchanges should also be applied to those currently exempted by the CFMA.

15. To what ex tent does the regulatory status of US future exchanges, as compared systems abroad that have greater regulation, contribute to high oil prices?

- This is a difficult question to answer. I do not believe that differences in the regulatory status of US versus foreign exchanges has any particular effect on oil prices.

- Exchanges abroad have both greater and lesser regulation, depending on the location. The centers of financial oil trading, however, are London and New York. In a perfect world, changes in regulation in the United States should be coordinated with changes in regulation in London. In practice, financial centers compete for business, so greater regulation in one center may cause an increase in trading activity in other, less regulated centers.

16. What type of energy regulation, or oversight, would be either most damaging, or most beneficial?

- Most beneficial would be application of the same disclosure, margin, and reporting rules (specifically, the CFTC Commitment of Traders report) to all exchanges. As always, provisions will have to be made for markets where liquidity is low and the reporting of positions might have the reverse of the intended effect, which is to promote competition.

- Most harmful would be regulations that are so onerous that the futures markets cease to function. Futures markets have played a vital role in the US economy for decades, and should be nurtured and promoted. It is paradoxical but true that the most effective markets have clear cut rules.

RESPONSES TO SUPPLEMENTAL QUESTIONS FOR THE RECORD
for

PHILIP K. VERLEGER, JR.

President, PK Verleger, LLC

JOINT HEARING OF THE
PERMANENT SUBCOMMITTEE ON INVESTIGATIONS
AND
SUBCOMMITTEE ON ENERGY
HEARING ON

SPECULATION IN THE CRUDE OIL MARKET

QUESTIONS FROM THE PERMANENT SUBCOMMITTEE ON INVESTIGATIONS:

1. *To the best of your knowledge, is the increase in speculation that we've seen over the past few years biased towards one side of the market or the other, in other words towards long or short positions, and, if so, what is the significance of that bias?*

   Answer: I have not done any statistical tests to determine whether speculative trading biases prices in one direction or the other. Furthermore, I do not believe I could do such a statistical test today because the measure of speculative activity provided by the CFTC is incomplete. Indeed, I worry that the CFTC's own tests conducted a year ago are incomplete due to trading that is not reported to the agency.

2. *What has been the effect of commodity index funds on crude oil futures prices? Have these funds added an upward pressure on prices or increased price volatility?*

   Answer: Commodity index funds provided a very useful stimulus to accumulation of commercial inventories in 2005 and 2006. The billions that flowed into the Goldman Sachs Commodity Index (GSCI) and the Dow Jones/AIG index may have led to the addition of 100 to 200 million barrels in stocks on a worldwide basis by increasing contango. These stocks moderated price volatility and probably caused prices to be lower. Unfortunately, the accumulations of stocks reduced returns to investors. Recently, managers of funds have changed strategies to reduce the impact of the cash on oil market price spreads. Today I suspect that the investment has less impact on the market.

   However, the inflow from investors almost certainly led to a reduction in market volatility.

Permanent Subcommittee on Investigations
EXHIBIT #24

3. *Does the DOE's placement of crude oil in a backwardated market affect U.S. crude oil inventories? If so, how and to what extent? Does the DOE's placement of sweet crude oil in a backwardated market affect PADD 2 inventories or inventories at Cushing, Oklahoma? If so, how and to what extent?*

Answer: The overall impact of DOE's placement of crude in the SPR on oil prices will depend on OPEC's reaction. The world crude oil market is not competitive. Thus, the effect of a decision by DOE to add oil to the SPR on prices of sour crudes will depend on OPEC's response.

DOE's decision to put sweet crude in the SPR today will put upward pressure on the price of sweet crude. As can be seen from the two tables at the end of this document, the available market for sweet crude is small, while the global demand is increasing. Table 1 lists the types of sweet crude DOE will accept for injection into the SPR. Also shown in Table 1 are the estimated volumes of each type of crude. Note that the total production of these 23 crudes is today around six million barrels per day. From this supply, DOE proposes to remove 40,000 barrels per day in the first half of 2008, 0.67 percent of the available supply. Using recognized elasticities, I calculate DOE's action may add 15 percent to the price of crude.

Table 2 shows the amount of oil imported by the United States, Canada, Europe, and China from countries in western and northern Africa as well as Europe. These nations are the world's primary producers of sweet crude. Note the rapid increase in imports, particularly with respect to China. This table emphasizes the fact that the decision to add sweet crude to the SPR at a time of tight supply just adds to competition from other buyers and puts upward pressure on prices.

DOE's action in a backwardated market will only exacerbate the situation. Backwardation is an indication that supplies are tight. (See Jeffrey Williams, *The Economic Function of Futures Markets*, Cambridge University Press, 1986, and the references contained therein.) Clearly removal of sweet crude from the market at a time of backwardation will have a greater impact than at a time of contango.

Given the locations of the SPR and reliance on international crudes to fill it, it may be better to use the price spreads in the Brent market rather than the Cushing market to determine the decision to fill the reserve.

4. *DOE states that the SPR fill has a negligible effect on prices because the amount of crude oil placed into the SPR is small compared to total global demand and supply. Do you agree with this position? When evaluating the impact of the volumes of crude oil placed in the SPR, is total global supply and demand the appropriate point of reference or denominator?*

   Answer: As revealed in the hearing, DOE has done no analysis. The committee is referred to the lessons taught to young lawyers. The story goes this way: "If the law is on your side, argue the law. If the facts support your position, argue the facts. If neither the law nor the facts support your position, pound the table, scream, and shout."

   DOE offers neither economic theory nor data to support its view. In truth, neither economic theory nor the facts support the agency's view. Instead, DOE just pounds the table, screams, and shouts.

QUESTIONS FROM SENATOR DOMENICI:

1. *Please explain the difference between investments and speculation?*

   Answer: I am not sure that I can answer this question. The academic literature on finance certainly does not help.

   Perhaps the best way to respond, at least with respect to commodities, is to define investment as the activity by participants ***who do not have the capacity to take or make delivery of the physical commodity***. These participants take a long position in futures for the intended purpose of earning a return that is expected to be negatively correlated with returns on equities and bonds. These participants would be expected to hold the position for the long term. They would do this by replacing long contracts in an expiring futures contract with a long position in a contract for later delivery of the same commodity. The replacement would be accomplished by offset—that is, by liquidating the long position in the expiring contract and taking a long position in the contract for the same commodity expiring at a later date.

   Speculation would be defined with respect to commodities as buying a futures contract in the expectation of a price rise or selling a contract in the expectation of a price fall.

2. *How have environmental regulations contributed to the increase in the price of oil?*

   Answer: This is a complicated question that should be addressed by the Energy Information Agency (EIA). Regretfully, the EIA has not assessed the issue—perhaps because political pressure brought by the Environmental Protection Agency (EPA) has prevented it from doing so. However, economists at the International Energy Agency (IEA) do not face such political pressure. Issues of the IEA's *Oil Market Report* published in April, May, and September 2007 have addressed the question.

As explained by the IEA and petroleum engineers, refinery productivity, measured using utilization rates, has been cut by the introduction of requirements in the EU and United States for the removal of all but ten parts per million (ppm) of sulfur from diesel fuel. The reduction probably amounts to four percentage points, meaning that more than one million barrels per day of gasoline and diesel supply is lost. The IEA explains that the lower productivity is caused by the need to shut refineries down more often due to the temperamental nature of desulfurization equipments that must be run at maximum pressures.

The need to operate refining facilities at maximum rates can be reduced to a certain extent when sweet crudes are processed. Some products from distillation can bypass the critical desulfurization units, reducing pressure on those facilities and boosting productivity.

The IEA makes clear that it is the desulfurization rules that took effect in 2006 that cause the problem. The National Petroleum Council warned of these problems in a 2000 study. However, the NPC warning was ignored. EPA's economic impact statements, wrongly in my view, dismissed such concerns.

3. *Would filling the Strategic Petroleum Reserve with a heavier sour crude instead of light sweet crude affect the cost of production and thus increase the price of petroleum products?*

   Answer: No. To the contrary, filling the SPR with heavier sour crude would have no impact on the cost of production today. In 1984, the NPC advised DOE that refiners would need sweet crude in the SPR. Twenty-three years later, the industry has invested huge sums to process heavier crude oil. As a result, refiners today can generally process the sour crude.

4. *Explain the impact on the price of oil by the Department of Energy filling the Strategic Petroleum Reserve with 110,000 bbl/d in your judgment?*

   Answer: As I noted in my testimony and in the answer to question 4 above, it is only DOE's decision to put 40,000 barrels per day of sweet crude in the SPR that affects prices. I suspect there would be no impact were DOE to put 110,000 barrels per day of sour crude in the reserve.

   The 40,000 barrels per day constitutes 0.67 percent of the available supply of sweet crude (see Table 1). This loss in supply leads to a 15-percent increase in prices if the price elasticity of demand for crude is -0.04, as estimated by Professor Nordhaus (reference in testimony). Given the growing demand for sweet crude to produce products meeting EPA/EU specifications and from China, as well as the lack of good substitutes, I fully expect to see such a price increase.

QUESTIONS FROM SENATOR MURKOWSKI:

1. *Can you explain why the price of gasoline has not tracked oil prices? Crude oil prices have increased by $29 per barrel or the equivalent of $.69 cents a gallon since the end of August, but gasoline prices have increased by $.32 cents per gallon or by half as much. Can you explain the disconnect here, especially when we saw the opposite trend in the spring, when gasoline prices increased by a greater percentage than crude oil prices?*

   Answer: This is an excellent question. The price of any petroleum product is set by supply and demand. Demand for gasoline has declined since August. The drop is due to the normal seasonal downturn and to price-induced conservation. DOE data do not seem to capture the drop in demand. Data from state tax authorities provide a much clearer but delayed view. For example, consumption in California has declined from last year by one percent according to the State's Board of Equalization, which has a 100-percent sample.

   The cost of producing gasoline will fall as demand declines. The cost and price is set by the cost of producing the marginal unit. Prices fell as demand dropped. During July, refiners were earning record margins for gasoline due to the high cost of producing the marginal unit. These costs dropped from $20 per barrel to $3. Profits and markups shrank.

   Last spring margins rose because the cost of producing the marginal unit increased. Next spring we may see the same effect.

QUESTIONS FROM SENATOR PRYOR:

1. *The sharp increases and extreme volatility of oil prices suggest that some part of the rise in oil prices is due to speculation by non-commercial investors. What indicators can regulators use to detect speculation?*

   Answer: I do not accept the premise. This is a hypothesis that requires detailed empirical investigation. I suspect that such an investigation will find that the source of volatility comes from increased use of puts by producers and calls by consumers such as Southwest Airlines to hedge revenues and costs.

2. *What do you think is the likelihood that current high oil prices will self-correct? If speculation is a factor in prices, will the bubble eventually burst as did the dot com and housing bubbles?*

   Answer: I do not expect prices to return to lower levels any time soon. To the contrary, I expect the price to continue rising due to global economic growth and the lack of investment by many OPEC countries. Please see the article from the Fall/Winter issue of *The International Economy*.

The one way to bring prices down would be the adoption of serious taxes on oil use. I have advocated a large gasoline tax since 1973. If such a tax were passed, it would be born primarily by oil-exporting countries, not consumers. However, politicians refuse to embrace the idea.

3. *Given that the oil market is international in scope and extremely interconnected, do you think regulation of financial players in the United States would have a noticeable impact on oil prices?*

   Answer: No.

4. *What are the economic implications of the recent increase in oil prices? How should monetary policy respond to these developments?*

   Answer: Chairman Bernanke published a seminal article on the issue in the 1998 *Brookings Papers on Economic Activity.* He explained that higher oil prices will essentially have no economic impact as long as central banks follow sound policies. The recessions of 1973 and 1979 occurred primarily because monetary policy from 1965 to 1979 allowed inflationary pressures to develop.

   The Bernanke view seems to be correct. Prices have risen 800 percent since 1999 with little or no impact. The key is for central banks to control inflationary expectations.

5. *The Commodity Futures Trading Commission (CFTC) oversees all futures trading on U.S. markets. However, the CFTC has no jurisdiction over foreign exchanges, such as the Intercontinental Exchange (ICE). How are the CFTC and ICE cooperating, or not cooperating, to regulate oil futures trading?*

   Answer: I will leave this answer to the CFTC and ICE.

Table 1. Sweet Crude Oils Acceptable for the Strategic Petroleum Reserve

Crude Name	Producing Country	Typical API Gravity (Degrees)	Typical Sulfur Content (Percent)	Estimated Production Volume (Thousand Barrels per Day)
Bonny Light	Nigeria	33.4	0.16	600
Bass River	Nigeria	35.2	0.14	200
Brent	United Kingdom	38.6	0.38	400
Cusiana	Colombia	43.0	0.12	170
Eckofisk	Norway	34.5	0.22	450
Escravos	Nigeria	34.3	0.16	265
Es Sider	Libya	36.5	0.40	300
Forties	United Kingdom	43.6	0.21	700
Girassol	Angola	30.5	0.35	230
Heavy Louisiana Sweet	United States	32.6	0.37	450
Kole	Cameroon	32.1	0.33	50
Light Louisiana Sweet	United States	37.3	0.35	400
Namba	Angola	43.4	0.16	140
Oseberg	Norway	38.7	0.22	270
Qua Iboe	Nigeria	36.3	0.13	360
Saharan Blend	Algeria	43.8	0.08	375
Santa Barbara	Venezuela	39.3	0.48	160
Statfjord	Norway	38.2	0.26	380
West Texas	United States	39.6	0.24	300
Intermediate	Equatorial	30.7	0.27	290
Zafiro	Guinea	42.8	0.06	30
Zarzaitine	Algeria			
Total				6,520
Total Adjusted for Nigerian Problems				6,000

Source: U.S. DOE, Office of Fossil Fuels; *EIG Crude Oil Handbook* (2006 edition); International Energy Agency; *Platts Oilgram News*.

Table 2. Data on Crude Imports into the United States, Canada, Europe, and China from Europe, North Africa, and West Africa (Thousand Barrels per Day)

	United States	Canada	Europe	China	Total
2001	2,601	734	862	104	4,301
2002	2,561	618	2,476	270	5,925
2003	2,857	685	2,564	349	6,455
2004	3,100	651	2,466	645	6,862
2005	3,590	653	2,355	650	7,248
2006	3,779	585	2,745	826	7,935

Source: BP Statistical Yearbook.

The Coming *Triple-Digit* Oil Prices

BY PHILIP K. VERLEGER, JR.

Most think tanks and government experts predict a price decline in coming decades. They're dead wrong.

The global economy has experienced wrenching change in the twenty years since the first issue of *The International Economy* was published. The Soviet Union collapsed, Mexico experienced a second debt crisis, the currencies of four Asian countries collapsed, and many economic customs were drastically altered following the September 11, 2001, terrorists attacks on New York and Washington.

Oil markets experienced even greater turmoil. Supplies were disrupted when Iraq invaded Kuwait in 1990. Production in Russia collapsed following the Soviet Union's disintegration. The Asian financial collapse brought crude oil prices back to 1973 inflation-adjusted levels, devastating industry investment. The war for Iraq's liberation may have permanently immobilized perhaps 5 percent of potential global crude production capacity. Hurricanes indiscriminately shut oil and gas production as well as refining capacity. Uncertainties regarding future global warming regulations delayed needed investments in additional capacity. Spreading nationalism in countries endowed with 70 percent of known hydrocarbon reserves further frustrated global efforts to boost supplies.

The chaos has led to very volatile day-to-day, month-to-month, and year-to-year oil price fluctuations, as can be seen from Figure 1. This graph charts oil price movement from 1987, when the first issue of *TIE* was published, to the end of August 2007. Within a year of *TIE*'s appearance, prices dipped to $10 per barrel, a level most experts thought had been banished forever. Famously, in 1979 Daniel Yergin and Robert Stobaugh assured

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It appears that triple-digit oil prices may become a regular feature of the global economy within three or four years, and soon the first digit may become something other than one.

the public of the certainty of higher prices, stating "higher real oil prices seem assured for the future, with the only questions being how soon and how high."[1]

Less than four years later, the world confronted very high prices once more when Iraq invaded Kuwait. But again, the high prices were transitory as crude collapsed to $10 per barrel in late 1998 after the Asian and Russian financial crises.

The energy price cycles experienced during *TIE*'s first twelve years occurred because the world's energy industry had excess capacity. This capacity was used to moderate price increases associated with supply disruptions such as Iraq's invasion of Kuwait or the suspension of exports from Iraq following the Gulf War.

Today the situation has changed radically. Global demand has grown dramatically with China's emergence, while capacity expansion has lagged. This makes Yergin's 1979 statement more plausible. Prospects for a prolonged period of lower oil prices in the coming decades are very low absent a severe recession or depression. Indeed, looking forward, it appears that triple-digit oil prices may become a regular feature of the global economy within three or four years, and soon the first digit may become something other than one. Without drastic changes to energy policies, oil-exporting countries that only eight years ago earned less than $200 billion per year may realize annual revenues as high as $2 trillion.

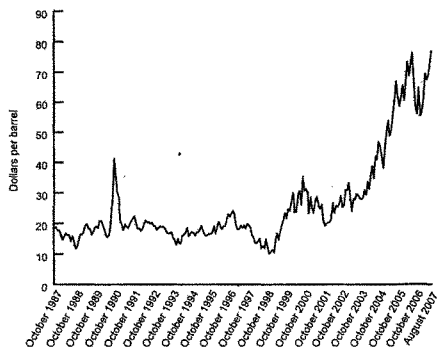
Six factors drive the change in the global energy system: economic growth, underinvestment, nationalism, investment uncertainty, nationalism in countries endowed with resources, and scale. First, global economic growth would boost energy and particularly oil use at near-record rates if supply were available. Second, twenty years of underinvestment have created supply constraints that make it impossible to meet growing demand. Third, spreading nationalism in countries holding the largest reserves of easily accessible oil and gas further worsen the supply problem. Fourth, needed investment in private-sector capacity expansion is being discouraged by uncertainty created by efforts to reduce global warming gases. Fifth, supply will be limited by conflicts in oil-exporting countries. Finally, efforts to substitute away from hydrocarbons or to conserve will be hampered by the problem's enormity. The stage is set for a period of very high energy prices.

RAPIDLY EXPANDING DEMAND: THE KEY

The rate of demand growth for energy, as well as the rate of growth for petroleum products, provide the key to the energy price outlook. The growth in energy consumption, in turn, is tied to the "intensity" of use. Many, if not most, projections issued by think tanks and government organizations over the last decade anticipate a decline in use in the coming two decades. These projections are carefully formulated and often elegantly presented. However, in most cases they are blind to history and, for that reason, likely wrong.

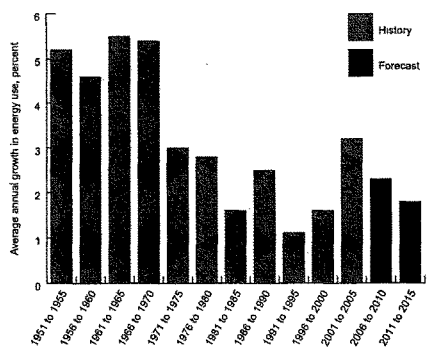
Projections issued by think tanks and government organizations over the last decade anticipate a decline in use in the coming two decades. However, in most cases they are blind to history and, for that reason, likely wrong.

Figure 1 Oil's Wide Ride: Spot Price of Dated Brent Crude from October 1, 1987, to August 31, 2007



Source: BP Statistical Review of World Energy (June 2007).

Figure 2 Increase in World Energy Consumption, 1951 to 2005, and projected to 2015



Sources: Energy in the World Economy (see text), BP Statistical Review of World Energy; IEA World Energy Outlook.

The problem that confronts economists is a lack of data. The history used by forecasters starts in 1965 or later. For example, the earliest data presented in the most widely used source book on energy, the *BP Statistical Yearbook of World Energy*, begins in 1965.

Unfortunately by starting with 1965 data, analysts miss the link between strong economic growth in emerging economies and energy use. Data are available though for the entire post-war period thanks to extensive research at Resources for the Future. These data reveal that the pattern of consumption was different in the fifteen years after the war. Figure 2 illustrates this point. There I show growth in world energy consumption for five-year intervals from 1951 to 2005 and International Energy Agency projections to 2015. Note that energy global consumption grew at 5 percent per year from 1951 to 1970. This rapid growth occurred simultaneously with the economic reconstruction in Europe and Japan after World War II, as well as the postwar growth in the United States.

History may well repeat from 2001 to 2020 as China, India, and other countries move from developing to developed nations. Consumption can be expected to increase at a pace close to the rate of economic growth in these nations, just as it did in Europe, Japan, and the United States following the Second World War. While proponents of conservation and alternative energy may assert that intensity of use is declining, the fact remains that infrastructure is energy-intensive. Construction of infrastructure seems to be the dominant feature of countries moving from third world to industrialized status.

The growth in energy demand is unlikely to be affected much by price increases. While energy use is sensitive to price fluctuations, it is more sensitive to changes in income. A review of the hundreds of good econometric studies of energy demand reveals that income elasticities are almost always three, four, or as much as six times as large in absolute terms as the price elasticities. As a general rule, I have observed that prices must rise by 3 to 5 percent for a 1 percent growth in GDP to hold use constant.

THE SUPPLY CONSTRAINT

Rising demand need not equate to rising consumption, however. Demand measures what consumers want. Consumption measures what consumers get after supply and demand balance. Consumption increases are likely to be modest because the global energy industry probably will not have the capacity

Hydrocarbons tend to be produced in geologically and politically unstable areas of the world. Supply interruptions must be expected.

to produce the volumes of "commercially consumable" energy forms demanded by consumers at today's prices. As a result, prices must rise.

These constraints on the supply of commercially consumable energy such as gasoline, diesel fuel, electricity, and natural gas have only recently become apparent. This spring the problems became apparent in gasoline and diesel fuel markets. In coming months, they will also affect other fuels such as natural gas and electricity. Supply squeezes will be evident in the United States, Canada, Europe, and Asia. Short- and long-term remedies will be hard to find. Instead, markets will resolve the problems.

In 1950, the world did not face such a capacity squeeze. Easily obtainable resources had been identified but not developed. International oil companies exploited them in a timely fashion. At the same time, ships and refineries were readily built, in part because industrial capacity previously directed to war production could be quickly converted to peacetime use. Today we have no surplus fabricating capacity.

The absence of complexity in processing also eased capacity expansion. An analogy to the airframe industry explains the evolution. In 1950 refineries were relatively simple, rather like the DC3 or DC6 airplanes that revolutionized air transportation. Today, refineries and oil field projects are very much like the Concorde supersonic jet, extraordinarily complex facilities that require years to build and great care to keep in operation.

In this cycle, then, the growth in capacity and supply of petroleum and natural gas will be much smaller than in the past. Price increases will substitute.

NATIONALISM

Plans to boost global oil and natural gas supplies between 2007 and 2027 will be additionally frustrated by the growing nationalism in oil-exporting countries. Today between 70 and 85 percent of the world's resources are off-limits to the integrated oil companies that have the skill to bring them into production rapidly.

Years ago, the economist David Teece suggested there was a "backward bending supply curve of oil from OPEC." Recent events seem to confirm his conjecture as the fraction of the reserves taken off the market seems to rise with prices. Over the last five years, we have seen western companies dismissed from Russia, Venezuela, and now Kazakhstan. The displacement of these firms by national companies further slows capacity expansion.

Mexico offers an excellent illustration. Private companies were pushed from that country almost a century ago. Today, Chevron and its partners have discovered a large reservoir in the Gulf of Mexico at a depth of ten thousand feet. Mexico also owns substantial deep-water reserves in the Gulf near its border with the United States. The Chevron partners are spending billions to develop the oil, initiating production in 2007. The Mexican reserves remain undeveloped because PEMEX, the country's state oil company, lacks the skills or resources it needs for the task. Recently, experts suggested the country would not be able to begin exploration on its property for at least a decade.

GLOBAL WARMING UNCERTAINTY

Uncertainty regarding how governments will reduce greenhouse gases further limits capacity investments. In the last year, executives of one major oil company very publicly explained they would not add refining capacity in the United States despite record margins, arguing that government ethanol mandates could soon make new capacity superfluous. Other companies in Europe and the United States are quietly following the same strategy. For example, buyers of TXU, an electric utility in Texas, canceled plans to build six coal-fired power plants because they expected the facilities' useful lives to be truncated.

The growth in energy demand is unlikely to be affected much by price increases.

This underinvestment will leave the United States, Europe, and other areas short of capacity. Further price increases will be required to balance supply and demand.

Ironically, those worried about global warming have missed this point. In his truly excellent report on climate change, Sir Nicholas Stern suggests that investors may need to be discouraged from investing in plants with high greenhouse gas emissions because they cannot be operated for normal useful lives. Recent developments suggest he need not worry regarding investors in the United States or Europe.[2]

GLOBAL CONFLICT

Prospects for energy supply and stable prices are further clouded by likely global conflicts. During the first twenty years of *TIE*'s publication, global energy markets have been roiled by two wars (Iraq's incursion into Kuwait and the 2003 invasion of Iraq), the Soviet Union's collapse, and peaceful revolution in Venezuela. In each case, the supply of oil and/or natural gas from the country experiencing the disruption was affected. Russia's production dropped almost 50 percent, while output from Kuwait and Iraq fell 90 percent. Output from Venezuela has been down as much as 30 percent.

Over the next two decades, we must expect similar disruptions. Output from Iran may be depressed by United Nations sanctions or the result of attacks on the country's nuclear facilities. Output from one or more other Gulf countries could be depressed by revolution, as could production from Nigeria. A serious earthquake could shut in crude from Alaska.

Many writers have noted that hydrocarbons tend to be produced in geologically and politically unstable areas of the world. Supply interruptions must be expected.

Those projecting relatively stable, if high, oil prices for the next two decades assume there will be little surplus capacity by 2012 or 2013 if all announced investment plans proceed according to schedule and even if programs to displace conventional energy proceed at projected rates. Much higher prices almost certainly will be required to balance markets.

SCALE PROBLEMS WITH ALTERNATIVES

Politicians, planners, officials in industries adversely affected by high energy prices, and many others have called for rapid development of alternative fuel supplies as well as the introduction of new consumption technologies. Legislatures across the globe have adopted mandates that require increased use of alternative fuels. Often the targets are higher than those unbiased observers with extensive experience in the sector believe achievable. President Bush's proposal to increase ethanol use to 20 percent of the U.S. gasoline pool by 2017 is an example of such a mandate.

These efforts are unlikely to succeed because the resources required to achieve the goals are not available. Most of the projects create demands for skilled labor and fabrication capacity that do not exist and cannot be created in a timely fashion. As noted above, investments in projects to produce conventional fuels such as gasoline will not be made by traditional suppliers, further exacerbating the gap between consumer demand and global capacity.

CONCLUSION

The International Economy began publication following fifteen years of economic tumult that included two recessions, the introduction of flexible exchange rates, and the default of a number of third-world countries on debt taken on after the first oil shock. Rates of economic growth during *TIE*'s first twenty years were far more stable thanks to the skillful exercise of economic policy tools. Prospects for a further decade or two of stable, strong economic growth are good if the world's central bankers demonstrate the discipline they have shown over last two.

Energy prices rising from current levels will be one consequence of the skillful management of global economics. Growing economies demand more energy. Prices must climb to reduce this demand if supplies are not available. Today there is little prospect for the increased supplies called for by economic expansion for a number of reasons, including those cited above.

The good news is that rising prices probably will not affect growth adversely. The world, as we have discovered, can live with rapidly increasing energy prices. To see this one need only note the better than 4.5 percent annual rate of growth from 1999 to 2006 at a time when crude prices rose by 800 percent. The challenge for policymakers will be to manage the wealth transfer—or alter it though taxation. In 1999 a group of exporting countries that included OPEC, Mexico, and Russia earned roughly $200 billion from their exports. In 2007, their annual revenues may reach $1 trillion and by 2012 they may surpass $2 trillion. ◆

NOTES

1. Roger Stobaugh and Daniel Yergin, *Energy Future* (New York: Random House, 1979), p. 4.
2. See *The Economics of Climate Change: The Stern Review* (Cambridge, England: Cambridge University Press, 2007), p. 205.