

Testimony of Kevin Book
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Before the
U.S. House of Representatives
Select Committee on Energy Independence and Global Warming
April 24, 2008

Chairman Markey, Ranking Member Sensenbrenner and distinguished Members of this Committee, thank you for the privilege of contributing to your discussion concerning the Strategic Petroleum Reserve (SPR). The opinions I will express this morning are my own and do not necessarily reflect the viewpoint of my employer, Friedman, Billings, Ramsey & Company, Inc.

Your April 21, 2008 invitation to testify posed the following four timely and thoughtful questions:

1. *How is continuing to fill the Strategic Petroleum Reserve impacting already high oil, gas and diesel prices?*
2. *How have energy prices responded in the past to suspending the fill or releasing oil from the SPR?*
3. *How could temporarily suspending the fill of the Strategic Petroleum Reserve affect the price of oil, gasoline and diesel fuel? How could a temporary suspension of the fill or releasing oil from the SPR affect speculation in oil markets?*
4. *What policy changes should be considered to more effectively fill the SPR in the future?*

My testimony today provides my best responses to these questions.

Fundamental Scarcity

The global oil system is complex, fragmented and beyond the control of any single government or corporate entity. Each day, the world consumes nearly 86 million barrels, or 3.6 billion gallons, of petroleum and refined petroleum products. During the course of the 149 years since the modern oil industry began in Pennsylvania, public and private entities have invested trillions of dollars into the extraction, refining, transportation and storage infrastructure that enables daily delivery of oil and oil products to market. Just maintaining this global system requires multiple billions of dollars per year in capital outlays; improving and expanding it will require tens of billions of dollars more each year, and this cost is rising rapidly as skilled labor and raw materials become scarcer.

Although it took almost a century and a half for this global infrastructure to evolve, demand patterns have shifted dramatically during the last five years. According to latest-available EIA estimates¹, OECD petroleum demand has remained essentially flat since 2003, rising only 350,000 barrels per day to an average of 48.96 million barrels per day, and IMF projections suggest that this level may have trended slightly downward in recent months as a result of economic slowdowns in the U.S. and several European economies. By contrast, non-OECD demand has risen approximately 18%, or 5.62 million barrels per day, to an average 36.63 million barrels per day during the same period. Simply put, the world's emerging economies have entered into their energy-hungry adolescence.

Credible geological assays and a historical perspective on petroleum production suggest that the world is neither running out of oil nor losing its capability to improve upon conventional recovery techniques that will supply a hungry market at a higher price. Oil prices of \$117 per barrel tell the world's investor-owned oil companies that it's worth their time to attempt engineering feats that were previously inconceivable or economically unviable, including the production of offshore basins that lie beneath the ocean's salt layer and the extraction and upgrading of heavy oil from dense tar sands. A supply response is underway, but it will take time. As many as seven to ten years may lie between the corporate decision to proceed and the delivery of new supply to the market.

In the short term, an unfortunate confluence of geopolitical risks within the world's most promising producing regions threatens the stability of existing oil supply. Mexican and Latin American governments may have failed to adequately invest in their oilfields, and resurgent resource nationalism throughout Latin America may exclude or deter future investment by private oil companies. Local conflicts in Africa – particularly in Nigeria – continue to depress production and interrupt exports. A combination of stultifying taxation and *de facto* nationalization of the petroleum industry may account for the recent flattening of Russian oil production. In Iraq, although production has improved markedly since war began in 2003, inadequate investment during the regime of Saddam Hussein and ongoing instability prevent

¹ <http://www.eia.doe.gov/emeu/ipsr/t21.xls>, updated April 11, 2008; accessed April 22, 2008.

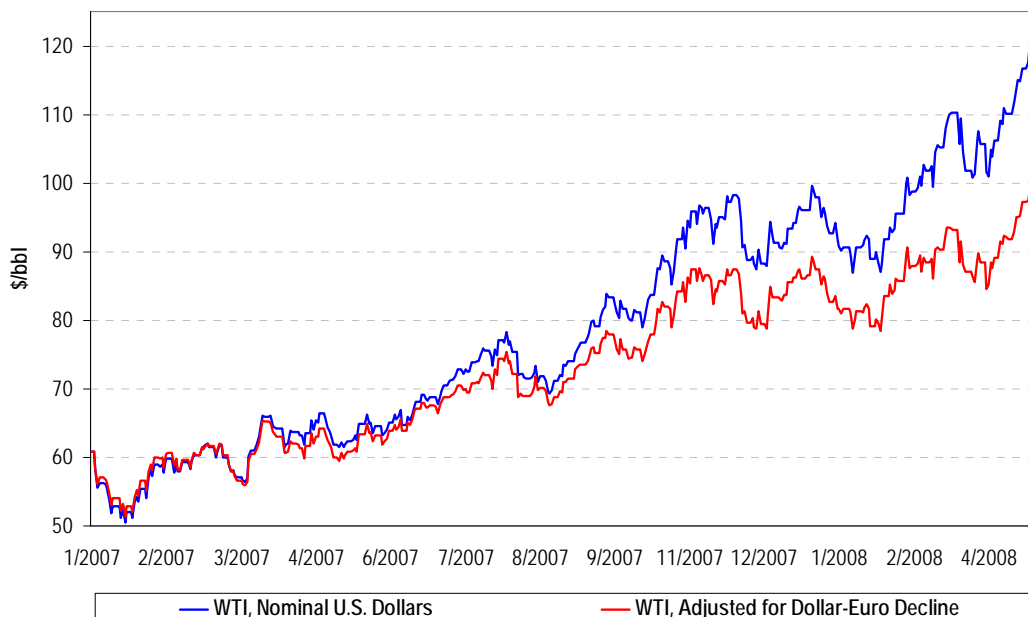
that nation from realizing its production potential which, by some estimates, could exceed five million incremental barrels per day. Adding to this unhappy mosaic, Iran's President has explicitly threatened to use oil as an economic weapon against the West by cutting off some or all of its 2.5 million daily export barrels. While this seems unlikely – it would effectively transfer wealth from Iran's treasury to Saudi Arabia – any interruption in Iranian production, intentional or otherwise, could consume virtually all of the spare capacity within the global oil system (recent global spare capacity estimates range from about 2.7 million to 3.2 million barrels per day).

Market Price and Supply Risk

Although markets serve primarily as clearinghouses for trade, I share the popular view that market prices also offer some predictive value by aggregating the expectations of participants regarding future events. If this proposition holds, then oil, as the world's most widely traded commodity, may exhibit significant predictive value. Because I do not dispute the short-term vulnerabilities of markets to mob dynamics, it may be prudent to discount the precipitous rise in crude price during the last week. That run-up may well be a bubble, and if it is, increasing evidence of declining demand and economic strictures may cause it to burst. Looking instead at the year-to-date average price of near-month NYMEX crude futures, the market has been pricing future oil supply at slightly more than \$100 per barrel. This price reflects a significant premium to the cost of extracting a "marginal" barrel from the Gulf of Mexico or Canadian tar sands, which I would estimate at approximately \$75 to \$80.

Some portion of the market price premium to extraction cost can probably be explained by the dollar's decline against the Euro, as presented below.

Dollar-Euro Adjusted WTI Front-Month Futures Price, January 1, 2007 – April 23, 2008, January 2007 Basis



Oil producers who buy services in Euros may require higher dollar prices to ensure adequate cash flows for future investment and to stem the value erosion of dollars held in their national treasuries. Speculative investment in oil as an asset class in general, or specifically as a hedge against the falling dollar, may account for some portion of these increases, but speculative dollars may be more likely to account for the velocity of oil price moves because speculators participate in the oil market as both buyers and as sellers. NYMEX data reveal that net non-commercial long positions have fluctuated significantly in recent months, possibly reflecting shifts in investor sentiment in response to troubling signs of global economic slowdown.

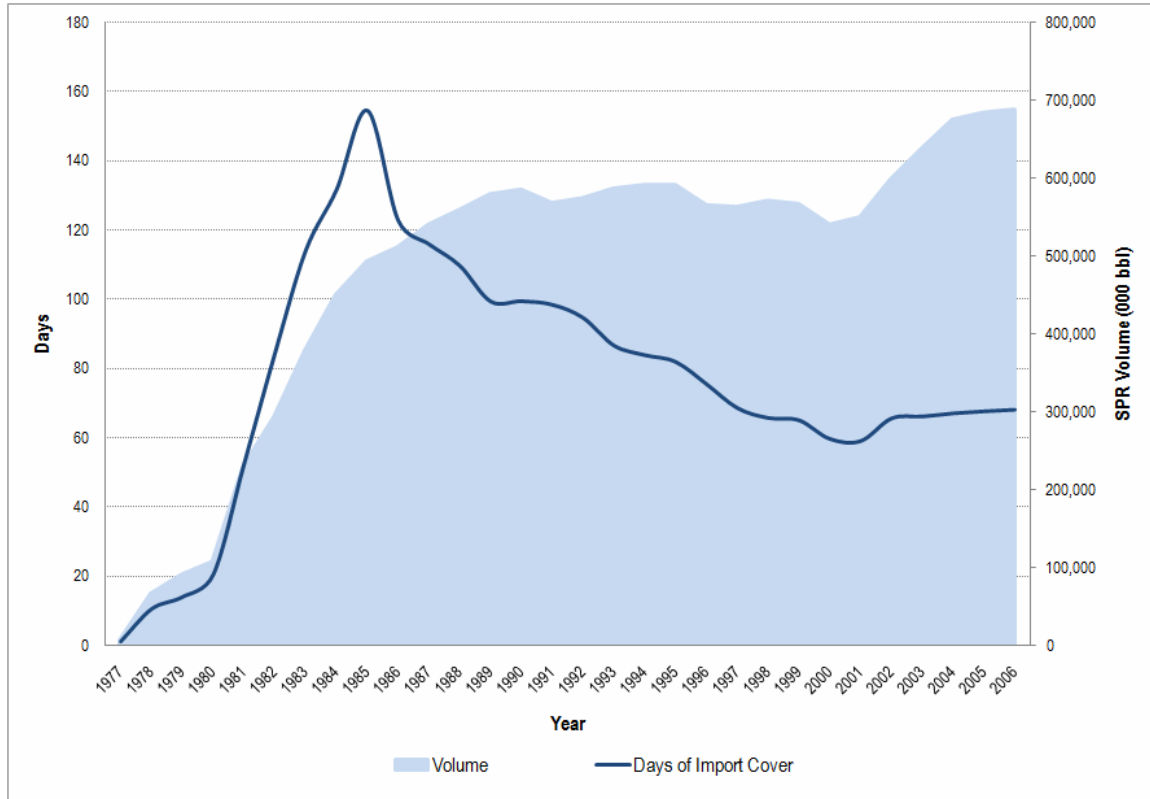
Though they may have garnered considerable attention in recent months, speculators aren't the only players in the oil markets. Commercial buyers of crude oil cannot operate their businesses without stable supply. This inflexibility inspires refiners to bid higher prices for oil at times of greatest perceived supply risk, a behavior that accelerates in many commodity markets when capacity utilization rises above about 90%. Production headroom of 3 million barrels per day in an 86 million barrel per day market suggests the global oil system is running at a capacity utilization of about 96.6%, well past the theoretical "danger point". In spite of this, commercial crude oil inventories remain at five-year average levels. Were it not for one particularly well-conceived U.S. energy policy action taken decades ago by this Congress, commercial buyers of crude oil might face strong incentives to bid considerably more than \$120 per barrel for future supply and to hoard as much oil as they could purchase in their commercial inventories. That policy action was the creation of the Strategic Petroleum Reserve.

The Strategic Petroleum Reserve and Oil Price

The creation of the SPR in 1977 provided the U.S. and its International Energy Agency (IEA) partners with meaningful protection against supply interruptions and insured against the threat that an unanticipated oil shortage might cripple the U.S. and global economies in the same fashion as the shortages that followed the 1973 Arab oil embargo and 1979 Iranian Revolution. The SPR conveys meaningful *implicit* economic benefits, as well. Although the SPR is not an instantaneous failsafe – it can take between days and weeks to deploy SPR oil to refiners around the nation – I would suggest that U.S. drivers may benefit on an ongoing basis from lower prices because refiners assured of durable future supplies can operate at lower inventory and working capital levels. The realistic prospect that the world's largest petroleum consumer will remain well-supplied in the event of a supply shock may also discourage predatory market behaviors including hoarding and "gouging" by commercial and non-commercial speculators alike.

One measure of the SPR's utility—the number of days of import coverage (storage levels divided by imports)—has declined recently, as presented in the graph below. This generally reflects that U.S. import dependency and consumption have risen together since the early 1990s as low oil prices deterred investment, conventional basins declined and U.S. transportation use of crude increased with household wealth.

Strategic Petroleum Reserve Absolute Levels (000 bbl) and Days of Import Cover, 1977 – present



Source: FBR Research using data from the U.S. Department of Energy

With great humility, I would submit that forecasts of oil prices and supply interruptions are difficult under any circumstances. Most price forecasts employ relatively simple numerical models that incorporate linear regressions against past relationships between prices and factors believed to affect supply and demand. The same is true for academic and industry studies of supply interruptions. Dramatic price changes in the absence of significant supply interruptions may diminish the value of historical comparables in assessing policy and market possibilities, particularly as it is difficult to derive the precise extent to which multiple contributing factors like refinery capacity constraints, currency depreciation and overseas demand growth may bias the historical relationship between demand cover and market price.

In my professional capacity as an analyst who serves Wall Street asset managers, I build my projections of potential price effects from political, economic and geopolitical events with probability-weighted scenario analyses – essentially, describing potential outcomes and making informed judgment of the odds that any outcome might occur. A similar methodology might best serve the goals articulated in the Chairman’s invitation letter.

Scenario Analysis: Fill, Suspend or Draw Down?

Scenario #1: Continuing “royalty-in-kind” fill at 70,000 barrels per day or a higher level. The high acquisition price of crude oil for commercial and strategic reserves might provoke one of two obvious responses: either it’s too expensive to add oil to storage at \$117 per barrel, or \$117 per barrel is a “price signal” that suggests imminent supply risk and should encourage public and private entities to fill their reserves. While I take the latter view, I recognize that this view is neither universal nor politically popular at a time when so many of the nation’s most economically fragile drivers are struggling to make ends meet.

In any case, I believe the appropriate mechanism for determining whether the Secretary of Energy should fill the SPR at current prices should be the level of import cover – measured in *days* – that may be needed to insure the nation against prevailing supply risk, not an absolute volume of *barrels* in storage. I would suggest that this threshold level should rely upon an informed assessment of the scale and duration of possible supply interruptions. Some supply risks may have short durations. For example, an Iranian export embargo might last days or weeks before economic reality might force one or both sides to capitulate. Other crises could conceivably endure sustained intervals. Repairing damage from a terrorist attack on the processing facility at al-Abqaiq in Eastern Saudi Arabia, for example, might require months.

While I do not consider myself a qualified judge of whether 65-70 days’ import cover represents a suitable safeguard for the U.S. economy, I would suggest that any assessment should err on the side of caution. Commercial refiners of crude oil make similar determinations based on their expectations of future demand. Refiners who run out of oil can go out of business, lose customers or suffer diminished equity valuations in the capital markets. Industrial economies that run out of oil will face tremendous economic hardship.

Scenario #2: Suspending 70,000 barrel/day royalty-in-kind SPR fill. Non-OECD economies account for the vast majority of recent growth in global oil demand. Any consideration of SPR fill policy should also examine why these economies are using so much oil.

Part of the reason appears to derive from U.S. consumption itself. Our trade partners use energy to meet our demand for goods and services. In turn, wealth transfer from U.S. buyers to overseas sellers enables greater oil consumption within export economies, an effect exacerbated in markets where exporters’ currencies are stronger than the dollar because this diminishes the pain of rising oil prices. A recession could conceivably shift one or both sides of this consumption function. Recent history suggests that a sustained recession might diminish demand by between 300,000 and 400,000 barrels per day. This is considerably less demand response than the 2.5 million barrels per day of demand destruction between 1979 and 1981, but the U.S. economy uses oil differently today. In the 1970s, oil supplied much more of the primary energy used for manufacturing, home heating and electricity generation. My analysis suggests that between 800,000 and 1.2 million barrels per day of Chinese oil consumption directly service U.S. consumer demand. Over time, a sustained U.S. recession might lead to declining Chinese crude demand, or demand growth, as exporters direct wares

towards other markets and eventually slow their production. The magnitude of this “echo” could add up to as much as 250,000 barrels per day.

Another driver of non-OECD demand growth may have more to do with politics than economics. The governments of highly polarized, collectivist, or politically concentrated societies often subsidize energy consumption in order to keep the peace and to stay in power, blunting price signals that might encourage conservation. These governments cannot prop up petroleum profligacy forever, but more than \$1.5 billion per day in oil revenues can buy a lot of goodwill. Absent a recession that slows growth in export economies, these nations might quickly absorb 70,000 barrels per day with little or no resulting price effect visible to the broader market.

The expectations of non-commercial traders may not shift significantly in response to a 70,000 barrel per day supply change, either, particularly if plans to suspend the SPR fill are clearly articulated and widely anticipated. 70,000 daily barrels represents less than one tenth of one percent of global headroom, far less than the 6.6% change in global spare capacity that might theoretically assuage the concerns of the most conservative commercial buyers and far less than the scale of last week’s disruption in Nigeria, which took 169,000 barrels per day offline. As a result, I would suggest that suspending the SPR fill might do very little to diminish the volatility and uncertainty that encourage speculation.

Scenario #3: Drawing down the SPR. When natural disasters and wars interrupt oil supply, sales from the SPR provide a buffer against the possibility domestic demand will exhaust available inventories. I would expect that an opportunistic drawdown of the SPR to influence prevailing oil prices would be likely, at least initially, to produce a meaningful price response, particularly if it undercuts the expectations of the futures market because it happens with little or no fanfare. On the other hand, the resulting price effect might quickly fade over time for two reasons.

First, commercial and non-commercial traders could begin to factor maximum achievable volumes of SPR oil (about 4.5 million barrels per day) into their price expectations. In this context, not only would the U.S. government become, effectively, just another “upstream” supplier of oil to the global market, but investors might begin to respond to any slowdown in SPR sales by bidding up crude futures contracts the same way they do today in the event of an unanticipated supply interruption or OPEC announcement of tighter production quotas.

Second, to the extent that global demand could not readily absorb new oil volumes, OPEC producers might react to dramatic price effects by slowing their rate of production. For the short term, OPEC could conceivably withdraw as much as 1.0 to 1.5 million barrels per day from global supply, and perhaps more if producers feared that oversupply might cause prices to plummet below the minimum price targets required to fully fund their domestic economies.

If OPEC did reduce quotas to defend prices, even in the event that practical considerations prevented the cartel from reducing output by more than one million barrels per day, I would

not expect long-term price expectations to change fundamentally. Maximum SPR flows could continue for little longer than five months before U.S. safety margins would be exhausted and OPEC market power would be even greater. During that time, global capacity utilization might fall from 96.6% to 92%, (below), but demand might also conceivably increase as commercial buyers augmented inventories in anticipation that SPR volumes might be exhausted.

Simplified Representation of Maximum SPR Flow Under Static Demand Assumptions

	Global Demand (MMbbl/d)	Global Supply (MMbbl/d)	Global Spare Capacity (MMbbl/d)	Total Global Capacity	Global Capacity Utilization %
Current Supply-Demand Balance (simplified)	86	86	3	89	96.6%
Maximum SPR Flow		4.5			
Possible OPEC Response		-1	1		
Resulting Supply-Demand Balance	86	89.5	4	93.5	92.0%

Source: FBR Research

Even if small, discretionary SPR draws could produce durable price responses, it's not clear that the resulting change in crude oil price would procure social benefits that sufficiently offset the social costs of spending down the insurance policy against a serious supply interruption. Let me offer an example for discussion purposes. EIA Administrator Guy Caruso provided the Senate Energy and Natural Resources Committee with his estimate that an incremental 100,000 barrels of oil might produce a \$2 price reduction. Taking the extremely unlikely assumption that this relationship remains constant on a linear basis, 350,000 barrels of daily SPR flows would result in about \$7/barrel in oil price reductions. Assuming a 10% refining margin, \$7/barrel would reduce wholesale gasoline prices from about \$3.06/gallon to about \$2.88/gallon, or approximately the same amount as a suspension of the \$0.184/gallon federal gasoline surcharge. On the other hand, discretionary draws would also create new questions that would require careful examination. Is 350,000 barrels per day a fair trade for \$0.18 per gallon? At what price reduction should SPR sales end? At what level of import cover should SPR fills resume, irrespective of price? And how should SPR sales proceed in the event that an economic slowdown fundamentally shifts demand downward and reduces oil prices?

Conclusion

The nation's Strategic Petroleum Reserve is a strategic success that should endure despite the tactical challenges of rising crude oil and petroleum-derived transportation fuel prices, particularly as these challenges continue to weigh upon every stratum of the U.S. economy. Because oil products fuel 97% of the world's vehicles, high oil prices have the potential to make virtually every economic activity more expensive. Inflationary pressures are already impairing profitability and raising end-user prices within transportation-intensive sectors like agriculture, aviation and logistics. If oil prices remain long enough at historic highs, transportation costs are likely to inflate end-user prices for all commercial enterprises that rely on global supply chains for their raw, intermediate and finished goods. On a national average basis, if latest-available home heating, electricity and gasoline costs continued for twelve months at current levels, the cost would add up to as much as 11% of disposable personal income, a burden that would weigh disproportionately upon lower-income families, long-distance drivers and small businesses with significant fuel requirements. The unfortunate implication is that U.S. oil demand may continue to slow as a function of consumer and business hardship.

There may be a silver lining to this gloomy prognosis, however, owing to the architecture of the oil markets and the interdependencies of global trade. Any fundamental respite from high prices resulting from demand contraction could send non-commercial traders rushing for the exits, potentially bringing a faster-than-anticipated decline in oil and oil products prices. Likewise, the untoward eventuality of weaker economic conditions in Europe could pressure oil prices on two fronts. Not only would weaker oil demand further expand global spare capacity, but a weaker Euro could reverse some of the currency effects on crude prices at the same time.

Perhaps most importantly, I believe the long-term implications of today's high oil and products prices will shape consumer behaviors well into the next decade. This presents an opportunity for this Committee to continue to support the virtues of conservation, environmental stewardship and energy efficiency. I am optimistic that this and future congresses will continue to build upon the foundation of energy security established by the laudable, new automobile efficiency standards within the Energy Independence and Security Act of 2007 by pairing still greater efficiency gains with ongoing, responsible, domestic crude oil production.

Mr. Chairman, this concludes my prepared testimony. Thank you again for the opportunity to be here today. I will look forward to any questions at the appropriate time.

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FBR Senior Analyst Kevin Book forecasts and interprets domestic and global economic and policy trends likely to impact energy sector investments. In addition, Mr. Book forecasts crude oil prices and covers a broad spectrum of environmental policy and alternative energy issues, including alternative power, alternative and renewable fuels and greenhouse gas regulation. Annually, Mr. Book's team publishes a comprehensive predictive analysis of U.S. and international energy policies and likely economic implications.

Mr. Book holds an M.A. in law and diplomacy from the Fletcher School of Law and Diplomacy and a B.A. in economics from Tufts University.

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Addressing Rule XI Clause 2(g)(4) of the United States House of Representatives, relating to Procedures of Committees and Unfinished Business, Kevin Book has not been the recipient of any federal grants or contracts during the current fiscal year or either of the two preceding fiscal years.