

An hourglass-shaped graphic with a globe of the Earth inside. The top bulb is dark blue, and the bottom bulb is light blue. The globe is centered in the narrow neck of the hourglass. The top bulb is filled with a dark blue color, and the bottom bulb is filled with a light blue color. The globe is centered in the narrow neck of the hourglass.

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*Middle East Oil Disruption: Potential Severity and Policy
Options*

Lawrence Kumins and Robert Bamberger, Resources, Science, and Industry Division

Updated April 29, 2003

Abstract. Should there be military conflict and a loss of crude oil to world markets, the United States has a range of policy options that are available for a timely response. Chief among these is the Strategic Petroleum Reserve, which has an initial drawdown rate of 4.3 million barrels per day. A Northeast Heating Oil Reserve could provide temporary relief should there be shortages of home heating oil in New England. The President can also release funds from LIHEAP, the Low Income Home Energy Assistance Program. The United States is also a member of the International Energy Agency, which can orchestrate a coordinated world drawdown of oil stocks. Oil disruptions often spur discussion as well about energy conservation measures, increased domestic production, and other long-term policy options.

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Middle East Oil Disruption: Potential Severity and Policy Options

Updated April 29, 2003

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Middle East Oil Disruption: Potential Severity and Policy Options

Summary

Military action in Iraq disrupted the world's crude oil supplies, but sufficient world supply was available during the disruption to keep the resulting price spikes within tolerable levels. With the elimination of the regime of Saddam Hussein, the resumption of Iraqi oil exports seems near, world oil prices have fallen, and adequate supplies from other exporters are available to satisfy near-term demand, which is entering the seasonally slack spring period.

Until they halted in mid-March 2003, Iraq's petroleum exports recently averaged about 1.5 million barrels per day (mbd), significantly less than the 3.7 mbd lost to world markets during the Gulf crisis in 1991. Consequently, price and supply impacts of the recent interruption were less severe. And other exporting nations were able and willing to increase crude oil supply during the disruption. The Organization of Petroleum Exporting Countries (OPEC) – holder of nearly all of the world's spare production capacity (equal to about three times Iraq's exports in 2002) – filled the supply gap.

OPEC administers a set of production quotas for its members, attempting to maintain prices in a range of \$22 to \$28 per barrel. Production by the OPEC-10 (excluding Iraq) increased as quotas were raised in the face of prices exceeding \$30 (they briefly peaked at \$40). The high prices resulted from added factors outside the Persian Gulf, including an oil workers strike in Venezuela. With Venezuela producing at about half its pre-strike level and Iraq's exports halted, other OPEC producers were able to keep world production constant. However, little reserve margin remains and prices have been slow to fall into OPEC's target price range.

This relatively benign oil disruption scenario took place because the conflict in Iraq did not impact other Persian Gulf producers. Had the conflict involved other producing nations or transport routes serving them, much larger oil market impacts would have resulted. With only Iraqi production affected, crude oil prices spiked briefly above \$30 per barrel, and average U.S. gasoline prices rose by 31 cents per gallon. A wider disruption could have caused price spikes as great as \$53 per barrel and of indefinite duration.

In case of a major loss of crude oil to world markets, the United States has a range of policy options that are available for a timely response. Chief among these is the Strategic Petroleum Reserve (SPR), which has an initial drawdown rate of 4.3 mbd. A Northeast Heating Oil Reserve (NHOR) could provide temporary relief should there be shortages of home heating oil in New England. The President can also release funds from LIHEAP, the Low Income Home Energy Assistance Program. The United States is also a member of the International Energy Agency (IEA), which can orchestrate a coordinated world drawdown of oil stocks. Oil disruptions often spur discussion as well about energy conservation measures, increased domestic production, and other long-term policy options.

This report will be updated as events warrant.

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Middle East Oil Disruption: Potential Severity and Policy Options

Overview

Military action in Iraq raised concerns about disruption of the world's crude oil supplies. The magnitude and duration of that disruption were key considerations in formulating a U.S. energy policy response. But the quantity of oil supply lost during the most recent Iraq conflict has been much smaller than during the 1990-1991 Gulf Crisis, which also included lost supply from Kuwait. During that conflict, oil prices rose sharply, but the price spike lasted only a few months; prices quickly returned to pre-crisis levels. After the fall of Saddam Hussein, it appears as if this pattern was replayed, as prices briefly spiked at \$40 per barrel early in the conflict and then quickly wound down into the \$20s.

In recent years, Iraq has exported crude oil intermittently under U.N. Resolution 986, often called the oil-for-food program. Frequent disagreements with the United Nations have resulted in Iraq's exports averaging less than 1.5 mbd during the past year, about half the country's potential. Therefore, the March 2003 disruption of Iraq's exports involved much less oil than a decade ago, so direct price and supply impacts were less severe.

In addition to the relatively small loss as a result of the conflict – which did not spread beyond Iraq – other exporting nations increased crude supply to the world market. The Organization of Petroleum Exporting Countries (OPEC) has most of the world's spare production capacity, equal to about three times Iraq's average exports in 2002. During most of 2002 and all of 2003, OPEC nations produced in excess of their cartel quotas, more than making up for Iraq's erratic exports and introducing an element of stability in a market where fear of a conflict led to a "war premium" on prices. In late 2002, a now-ended oil workers strike in Venezuela shut down exports, but other OPEC exporters offered sufficient supply to offset these shortfalls.

Had a Persian Gulf conflict involved other producing nations or export transport routes serving them, much larger oil market impacts would have been involved. Much of the crude sold in international trade originates in the area; 13 million barrels per day (mbd) is shipped through the Strait of Hormuz. This is the world's most important oil choke point,¹ consisting of 2-mile wide inbound and outbound lanes – with another 2-mile separation zone between them. The Strait is bounded by Iran to the east and Oman and the U.A.E. to the west.

¹ EIA, World Oil Transit Chokepoints, at [<http://eia.doe.gov/cabs/choke.html>].

Looking toward its reconstruction, Iraq has great potential as an oil producer. Its current amount of proven reserves could support further oilfield development – given the availability of investment and technology – to greatly expand output. And, since there has been little exploration in Iraq for many years, it is believed that greater oil resources are potentially discoverable. Were these resources to prove out, Iraq could potentially rival Saudi Arabia and Russia as the world's largest oil producer, upsetting the balance of power in the petroleum geopolitical arena and potentially having a profound impact on pricing. But this might not happen quickly: It could take up to two years of rehabilitation to boost Iraq's output to its historic high levels²

To offer protection in the event that world oil supply had been more seriously impacted for a longer period, the United States has a range of policy options that are available for a timely response. Chief among these tools is the Strategic Petroleum Reserve (SPR), which has an initial drawdown rate of 4.3 million barrels per day (mbd). A Northeast Heating Oil Reserve (NHOR) could provide temporary relief should there be shortages of home heating oil in New England. The President can also release funds from LIHEAP, the Low Income Home Energy Assistance Program. These and other short-term options are discussed in greater detail below. Because disruption and price spikes often spur discussion about energy conservation, and diversification of energy production and sources for imported oil, longer-term policies, such as raising Corporate Average Fuel Economy (CAFE) standards, are also discussed in this report.

OPEC Production Capacity

The Organization of Petroleum Exporting Countries consists of 11 members – Algeria, Indonesia, Iran, Iraq, Kuwait, Libya, Nigeria, Qatar, Saudi Arabia, the United Arab Emirates (UAE), and Venezuela. These nations own two-thirds of the world's proven crude oil reserves and control about one-third of the world's current production. With world oil market stakes this big, OPEC acts as a cartel, attempting to balance supply with demand to achieve certain price levels. OPEC administers a set of crude oil production quotas for its members, attempting to maintain prices in a range of \$22 to \$28 per barrel established in March 2000.

The OPEC quotas nominally restrict production. However, the June 2003 quota – set at OPEC's April 24 meeting – was 25.4 mbd (minus Iraq), while DOE estimated that the 10 members produced 26.4 mbd in April, having ramped up production throughout the winter to compensate for the expected loss of Iraqi crude and a Venezuelan output shortfall.³ As shown in Table 1, most of OPEC's surplus capacity is located in Saudi Arabia, which has 10.0 mbd of capacity, which could increase to 10.5 mbd with 90 days' lead time, according to DOE's Energy Information Administration.

² Yahoo! Finance quoting Reuters: *Iraq oil boost after war would take 2 yrs – experts*. March 18, 2003

³ *OPEC Brief*, April 9, 2003. Page 5.

Table 1. OPEC Quotas, Production, Capacity, and Surplus Output Capability
(mbd)

Country	April 03 Production	New Quota (June 03)	2003 Production Capacity	Current Surplus Capacity
Algeria	1.2	0.8	1.2	nil
Indonesia	1.1	1.3	1.1	nil
Iran	3.8	3.7	3.8	nil
Kuwait	2.5	2.0	2.5	nil
Libya	1.4	1.4	1.4	nil
Nigeria	1.4	2.1	1.4	nil
Qatar	0.8	0.7	0.9	0.1
Saudi Arabia	9.6	8.3	10.0 to 10.5	0.4 to 0.9
UAE	2.3	2.2	2.5	0.2
Venezuela	2.5	2.9	2.5*	nil
OPEC 10	26.4	25.4	27.1 to 27.6	0.7 to 1.2

*Estimates are uncertain.

Note: Rows and columns may not add due to rounding.

Source: Energy Information Administration, *OPEC Fact Sheet*, April 9, 2003, and *Platts Oilgram Price Report*, April 24, 2003, page 5.

OPEC has met regularly trying to keep quotas at levels matching world crude demand, making frequent adjustments to reflect market realities. Table 1 shows these numbers, as well as members' maximum production capabilities. The new OPEC-10 output ceilings total 25.4 mbd, 1.8 to 2.2 mbd below estimated maximum production levels. The spare capacity figures measure the world's reserve production capability – the ability of major producers to respond to a supply shortfall, such as the halt of exports from Iraq or labor difficulties in Venezuela.

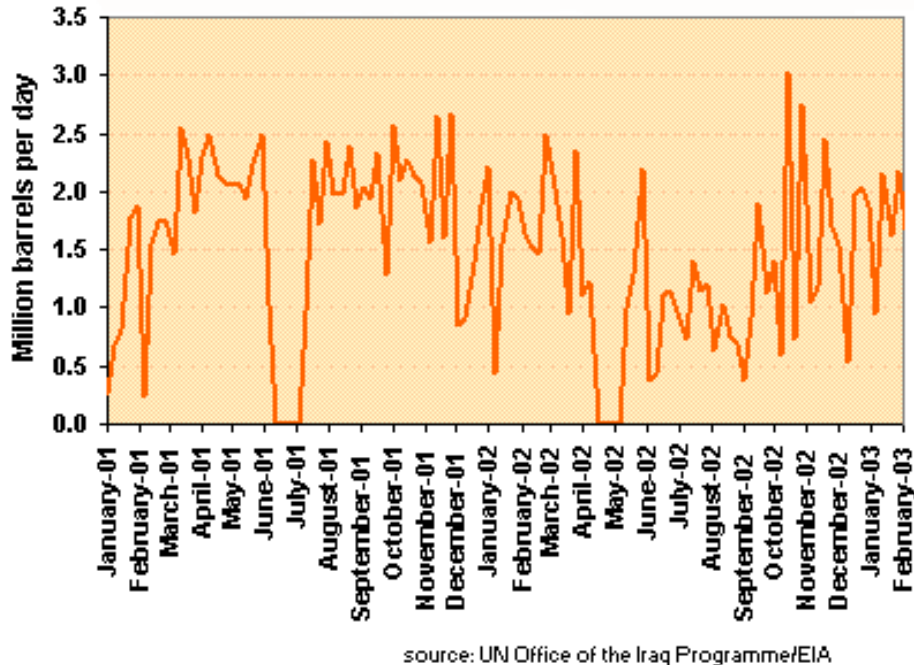
In the United States, commercial crude inventories bottomed at the lowest levels ever observed, about 270 million barrels, in March 2003. That was less than 14 days of end-use demand, which stands at 20.1 mbd,⁴ a very high level. U.S. inventories of crude and refined products have since recovered. Inventories held by members of the Organization for Economic Cooperation and Development (OECD), as reported in March 2003 by the International Energy Agency, are also below normal levels.⁵

⁴ Energy Information Administration. *Weekly Petroleum Status Report*. For week ended March 14, 2002.

⁵ International Energy Agency. *Oil Market Report*. March 12, 2003.

Supply From Iraq

Figure 1. Iraqi Crude Exports - Jan. 2001 to Feb. 2003



source: UN Office of the Iraq Programme/EIA

Iraq participates in OPEC deliberations and plays a role in pricing decisions. But, because it had been exporting oil under the oil-for-food program established by U.N. Resolution 986, Iraq does not participate in OPEC's production quota system. Sales under Resolution 986 often involved disputes that resulted in an uneven flow of crude to world markets.

Figure 1 shows that this flow fluctuated from nil to as high as 3.0 mbd; it averaged about 1.5 mbd for the year before the war. Iraq's U.N.-sanctioned exports averaged 1.7 mbd during February 2003 – supply that halted once the war began.

It appears that the loss of Iraq's recent exports was made up by OPEC-10 producers, who hold most of the world's available unused production capability.

Before the Iraq war, there had been an expressed willingness on OPEC's part to replace lost supplies in the event of an armed conflict. OPEC President Rilwanu Luckman was quoted in *Platts Oilgram News* as saying that:

... OPEC would ensure that oil markets remained adequately supplied in the event of Iraqi exports being cut off as a result of a US-led military action against Baghdad. If conflict with Iraq led to the stopping of Iraqi exports, OPEC has enough spare capacity to prevent a market shortage, he said.

“If it happens only to Iraq, we have enough [capacity] to meet demand,” he said, although if exports from other key Middle East producers such as Saudi Arabia and Kuwait were disrupted “you’re talking about a different scenario.”⁶

As Luckman suggested, had military conflict impeded oil exports from neighboring countries, the dimensions of the supply shortfall would have been larger and potentially exceeded the uninvolved OPEC members’ surplus production capacity.

On March 17, 2003, U.N. Secretary General Annan told the Security Council that he had ordered the evacuation of all U.N. staff from Iraq and suspended the oil-for-food program. Oil exports began to dry up a few days earlier, amid rising concerns among shipowners, as well as insurance and credit providers. But OPEC did make good on its promise; as Table 1 shows, the cartel’s production increased enough to offset lost Iraqi crude.

Venezuelan Situation

At the beginning of December 2002, Venezuela’s national oil company, PDVSA, experienced its second strike of the year, virtually halting production for the next 6 weeks. The politically important firm employed many opponents of President Hugo Chavez who were displeased with government measures that curtailed investment and allowed the entry of foreign oil producers to the nation’s oil fields. The strike was led by a group of fired former executives and numerous PDVSA workers who were sympathetic to the political opponents of President Chavez.

PDVSA is responsible for 2.5 mbd of conventional oil production capacity – much of which comes from very old fields – and 1.2 mbd of refinery capacity. In addition to PDVSA-managed oil fields, Venezuela has 0.5 mbd of unconventional heavy oil production that is run by international oil companies not involved in the nation’s internal political affairs. In November 2002, the nation produced 2.9 mbd, exporting 2.4 mbd, with as much as 1.5 mbd in crude and refined products imported by the United States.

With the strike – which also affected shipping – all exports stopped, and they did not resume until January 2003. Reports on current export levels differ depending on their source. The Chavez Administration contends that they are back to normal; PDVSA contends less. *Platts Oilgram* reports February production of 1.5 mbd,⁷ but does not estimate exports. DOE reports that imports from Venezuela were only 400,000 barrels per day during January 2003, far under their 2002 average of about 1.4 mbd.⁸ But by April, DOE figures show output had risen to 2.5 mbd, which is the currently estimated output ceiling.

⁶ *Platts Oilgram News*, November 6, 2002. Page 2.

⁷ *Platts Oilgram Price Report*, March 10, 2003. Page 1.

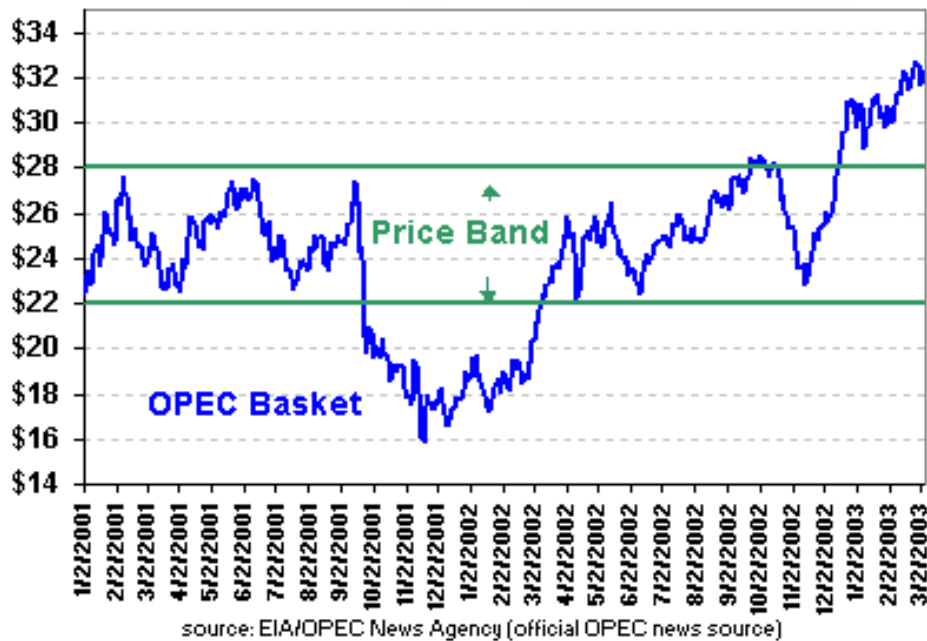
⁸ Crude Oil and Petroleum Imports, Top 15 Countries. DOE, March 12, 2003

Current Crude Oil Price Factors

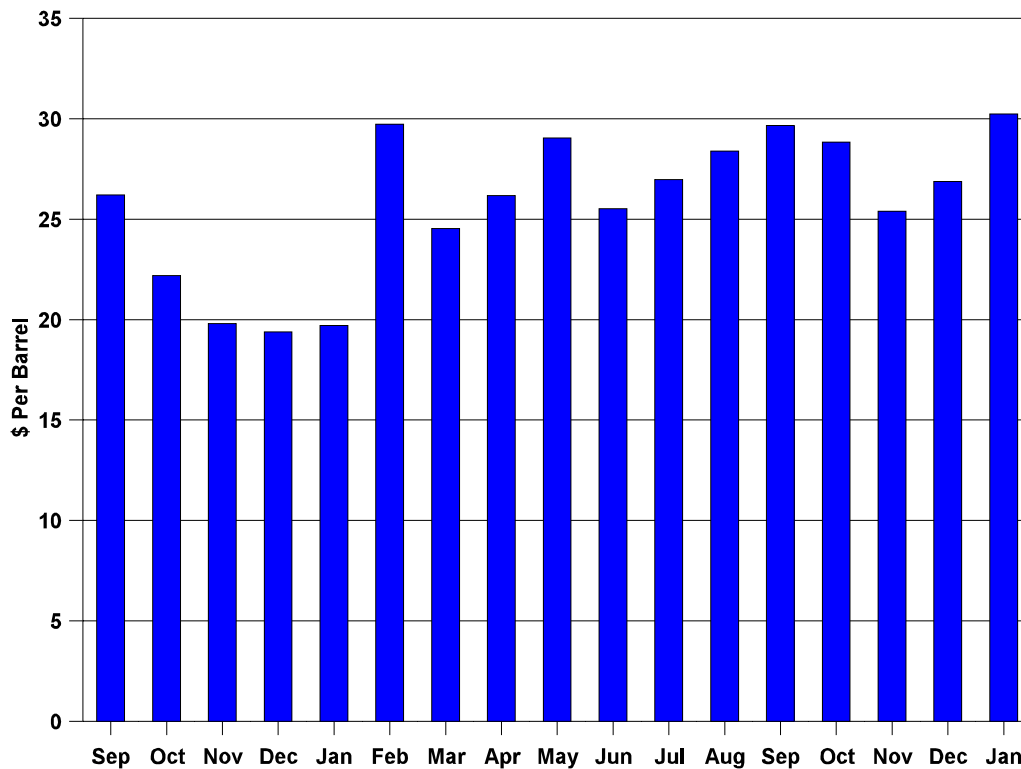
OPEC “Price Band”

Despite significant overproduction relative to the OPEC quota, oil prices seem to have remained within the cartel’s desired band for all but the most recent three months of the nearly two-year period since the price band was established. This is shown in Figure 2. Spot market data following the end of major fighting in Iraq suggests that prices have dropped back into the “band.” To determine whether prices are within the band, OPEC calculates the average price of seven internationally traded crudes,⁹ often referred to as the “OPEC basket.”

Figure 2. OPEC Basket Prices, Jan. 2001 - March 2003



⁹ The crudes are from Algeria, Indonesia, Nigeria, Saudi Arabia, the UAE (Dubai), Venezuela and Mexico (which is not an OPEC member).

Figure 3. U.S. Crude Oil Prices, Sept. 2001 - Jan. 2003

Source: Energy Information Administration

“War Premium” or Supply-Demand Fundamentals?

During past months, U.S. crude prices have tracked the OPEC price band, fluctuating between \$20 and \$30 per barrel (bbl). Figure 3 above depicts the fluctuation graphically (although early-2003 average prices are not available yet – they would show prices in the low-to mid \$30s). Some of this variation is thought to be related to supply and demand fundamentals. Another factor that may have pushed prices higher – the so-called “war premium” – was thought to result from supply uncertainty surrounding the pre-war political situation in Iraq. As described in the *Oil and Gas Journal*:

Inherent in the view that a war premium – which various analysts have pegged at ranges of anywhere from \$2-4/bbl to \$6-9/bbl – exists is the corollary view that the likely quick end to a US-led military strike on Iraq would spawn a collapse in oil prices. The precedent for this view is the 1991 Desert Storm campaign to oust Iraqi forces from Kuwait, whose onset spawned history’s biggest 1-day drop in oil prices.¹⁰

¹⁰ *Oil & Gas Journal*, October 21, 2002. “Tanker Attack Underscores ‘True’ Market Tightness.” p. 80.

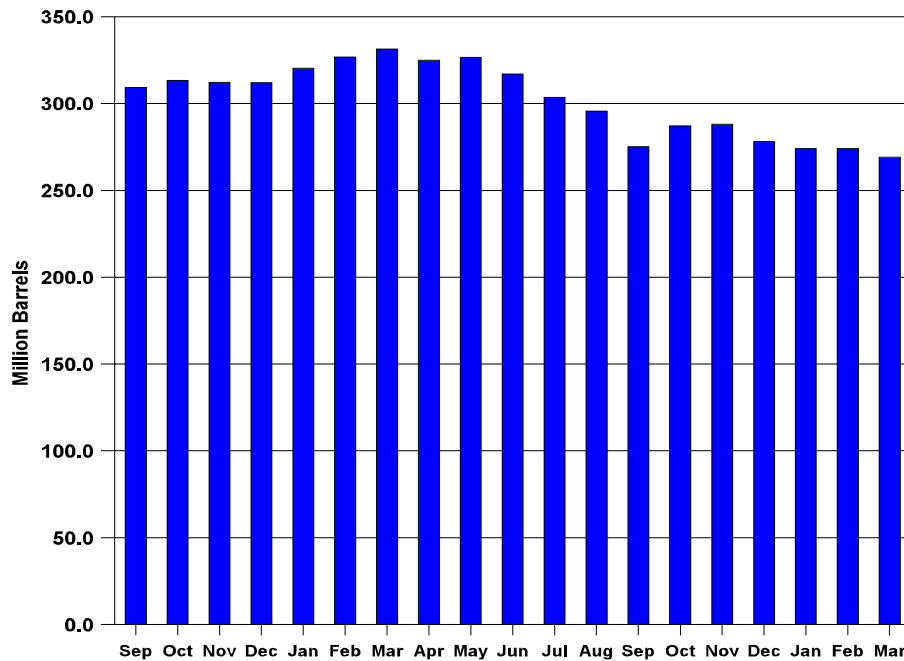
Estimates of a war premium spanned a broad range and were, to a large extent, based on attempts to quantify the psychology of crude oil markets. Some estimates attributed the whole price ramp-up – from the low prices of about \$20 per barrel at the start of 2002 to this year’s highs of \$30+ in February 2003 – to a war premium. On November 8, when the U.N. Security Council voted on unrestricted weapons inspections in Iraq, U.S. crude prices stood at \$25.65, according to Bloomberg. Prices did not rise in response to the U.N. action but remained in the mid-20s for the remainder of the month.

While the war premium was widely debated, the fundamental factor apparently shaping crude prices is current demand and supply, as at least partly measured by U.S. commercial crude inventories. Refiners’ crude stocks have been declining since the end of winter 2001-02. Figure 4 below illustrates this, showing that stocks reached a recent peak of 331 million barrels in March 2002. Since then, they continued to decline. U.S. commercial crude oil inventories stood at 269 million barrels in early March 2003, the lowest level observed since EIA began collecting data. Since then, stocks have begun to recover.

Scenarios for Oil Disruption and Price Spikes

A number of analyses predicted that military action against the Saddam Hussein regime would be relatively brief and probably not spill over into neighboring countries. Under that scenario, the experience of the 1990-91 Persian Gulf War indicated that a mild spike in world oil prices could be reasonably anticipated. But these analyses also suggested that if military action were to trigger a broader conflagration – considered far less likely but plausible enough not to be overlooked – oil prices could triple.

**Figure 4. U.S. Crude Oil Inventories
September 2001 to March 2003**



Crude Prices During the 1990-1991 Gulf Crisis

In August 1990, Iraq invaded Kuwait, leading to the halt of oil exports from both countries. Based on 1989 data – the last full year of production in both countries before the conflict – production amounted to 2.9 mbd and 1.8 mbd respectively.¹¹ Subtracting internal consumption of about 500,000 per day for each producer, the remaining 3.7 mbd was lost to international commerce when the conflict began. This amounted to a very large shortfall, although it was made up by other producers within several months.

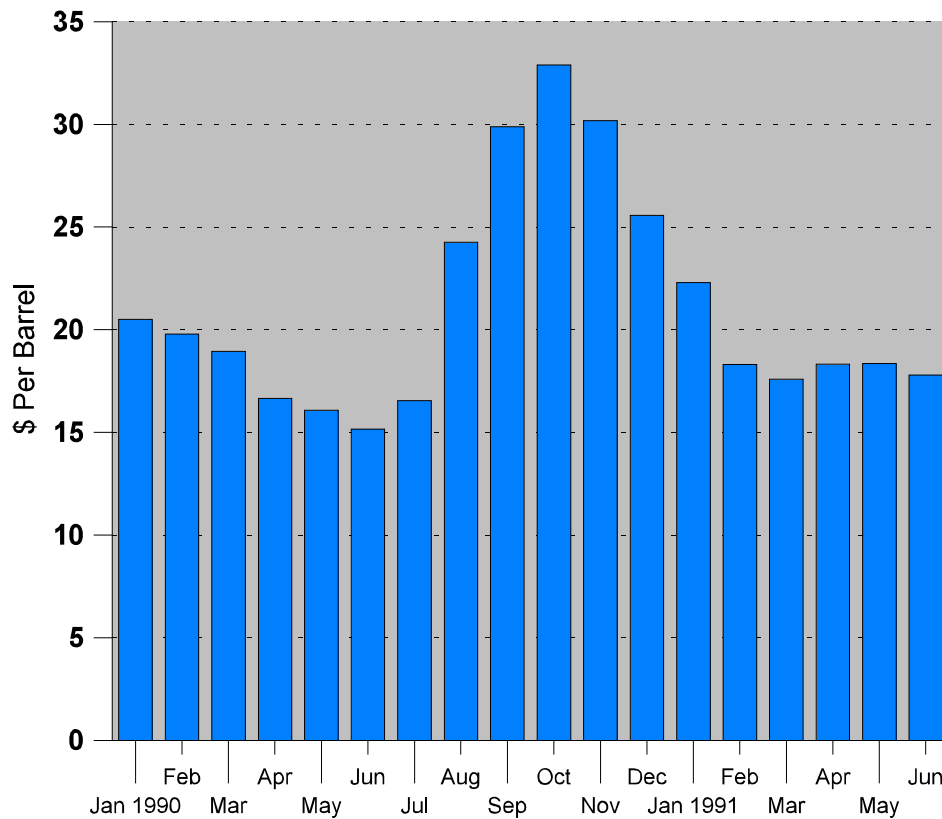
Figure 5 shows the reaction of prices for U.S. crude imports during the period encompassing the Gulf Crisis. Prices rose immediately in August 1990 when Iraq invaded Kuwait. This ended a long period of relative stability. When the U.S. and its allies started air attacks on Baghdad in January 1991, prices fell quickly. By February they had returned to levels comparable with the first part of 1990. The period of price fly-up was very brief, but it involved the halt of oil flows from both Iraq and Kuwait.

The world oil market overcame the lost production stemming from the conflict by dint of increased production elsewhere. At the time, spare capacity was plentiful in a number of countries. Saudi Arabia – which increased its output by about 2.0 mbd – was the major supplier of make-up oil. Iran and the U.A.E. added 600,000

¹¹ *International Energy Annual–1992*, Table 1.

and 500,000 barrels per day respectively, with the remainder made up by a diversity of producers¹².

Figure 5. Imported Crude Oil Prices, 1/90 to 6/91



Source: *Historical Monthly Energy Review*, 1973 - 1992. Table 9.1.

Potential Impact of a New Disruption

Much less oil was involved in the recent Iraq war than was lost in the 1990-91 Gulf Crisis, because the latest conflict did not spill over and affect other Persian Gulf producers. With supplies from Iraq having turned into an off-again-on-again proposition during 2002 – and averaging only 1.5 mbd – world markets were not over-dependant on this crude. And with other OPEC members holding more unused capacity than this amount – and willing to utilize it – there has not been a significant supply problem. But had any conflict to spilled beyond Iraq and affected nearby producers, as OPEC president Luckman said in the quote above, “you’re talking about a different scenario.”

What sort of “different” scenario might Luckman have been referring to? Probably a set of potential conflict outcomes involving consequences so dire that policymakers address them with great hesitation. Examples of such hypothetical

¹² *International Energy Annual–1992*, EIA. Table 1.

developments could include political instability in Saudi Arabia and/or interdiction of shipping in the Persian Gulf. Such developments might have involved loss of unprecedented amounts of crude supply to the world market, with impacts beyond the range of experience. With no historical guides, estimates of what might have happened can only be made with little expectation of accuracy. Nevertheless, logic suggests substantial impacts from losses of crude supply far beyond the make-up capability of exporters (and/or strategic reserves in consuming countries) not drawn into an expanded conflict. At a pre-war Center for Strategic and International Studies (CSIS) conference on the economic consequences of an attack on Iraq, one speaker suggested that oil prices could reach \$80 per barrel under a worst-case war scenario.¹³ That would be nearly triple the December 2002 price of about \$27 per barrel.

This depiction of the most dire outcome of the Iraq conflict – featuring widespread spillover throughout the Middle East – probably bounded the upper range of a crisis-related oil price escalation. The duration of this level of pricing would have depended on the policy response of consuming nations, the production response of virtually all the world’s producers, and the demand response to much higher prices.

The CSIS conference summary is available on the organization’s web site [<http://www.csis.org>]. In it, Anthony Cordesman and Larry Goldstein described similar worst-case scenarios in which oil production ceased in Iraq, oil facilities in other Persian Gulf nations were attacked, and severe political unrest broke out in the region. Goldstein’s scenario estimated the loss of 5 to 6 million barrels of daily exports; Cordesman assigned a 5% to 10% likelihood that his worst-case outcome would occur.

Both analysts depicted a most likely, relatively benign scenario as well. Among its features were the cessation of Iraqi oil production for 3 months, followed by a slow ramp-up to current levels, other OPEC producers’ making up the lost output, and some panic buying at the start of hostilities causing a short-lived price spike. Cordesman assigned a 40% to 60% probability of this scenario’s playing out.

Regarding the most likely scenario, which actually played out, Iraqi oil supply was the only oil lost to the world market, and history provided a guide to what could have been expected to happen to crude prices. During the 1990-91 Gulf Crisis, when both Iraqi and Kuwaiti exports were halted, spot-market prices briefly peaked at roughly \$40 per barrel. This reflected not only the soon-to-be-replaced supply shortfall, but the market psychology associated with the events. While representing a 41% increase from the December 2002 level, the actual price spike – as predicted under this scenario – turned out to be a short-lived market reaction as producer and policy responses mitigated the disruption’s effects.

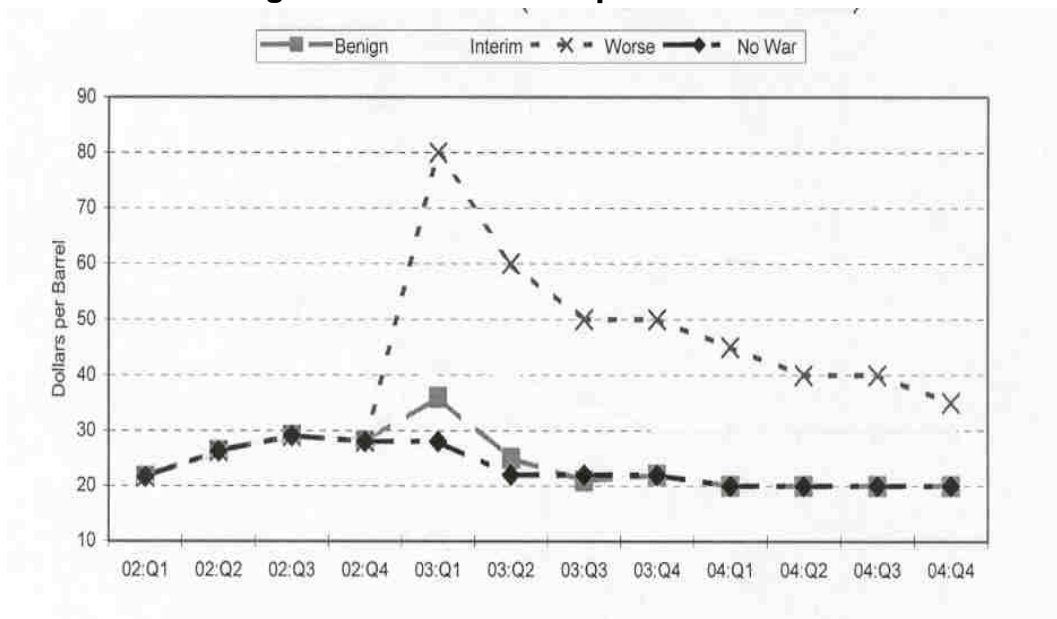
Figure 6 below – reproduced from the CSIS conference summary – shows projected price paths for U.S. crude oil prices leading up to and following the

¹³ Larry Goldstein of the Petroleum Industry Research Foundation, speaking at “After An Attack On Iraq: The Economic Consequences,” a conference held at the Center for Strategic and International Studies, November 12, 2002.

assumed start of hostilities in the first quarter of 2003. This reproduction shows the benign and worst-case price scenarios, as well as a baseline “no war” price trend. Without war, Goldstein forecast that crude prices would have declined from the current high \$20s to about \$20 per barrel by mid-2003.

Taken together, these scenarios reasonably defined the range of conceivable oil market disruptions resulting from the invasion of Iraq. Thus, using mid-December 2002 price of \$27 per barrel as the base, brief price spikes as great as \$11 were considered the most likely impact, but they could have been as great as \$53 and of indefinite duration under a worst-case scenario.

Figure 6. CSIS Price Spike Scenarios



Potential Prices at the Gas Pump

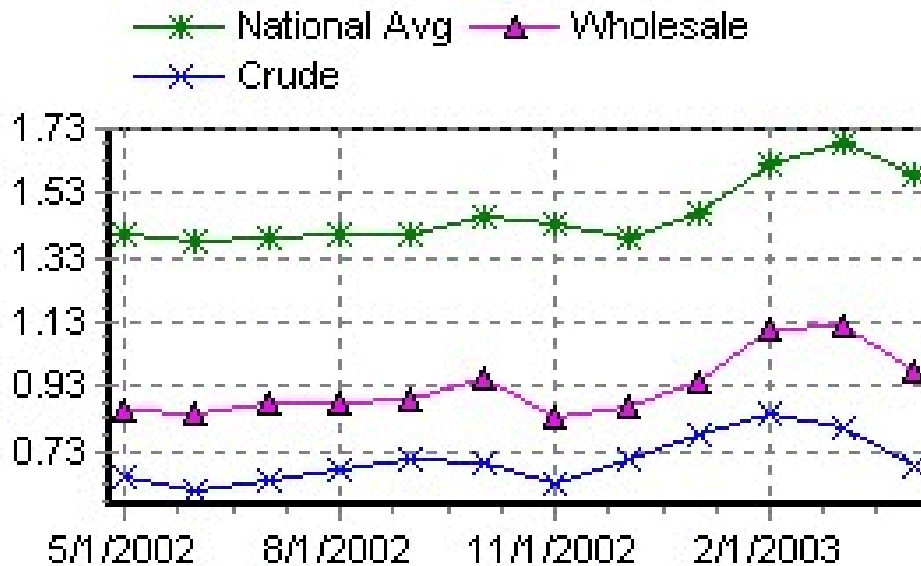
Public response to oil price shocks is often determined by price developments at the gas pump. Gasoline prices tend to track crude oil prices on a penny-for-penny (per gallon) basis. Figure 7 below shows the close relationship between the two for the bulk of the time frame.

There are 42 gallons per petroleum barrel. Dividing the crude oil price increases discussed above by 42 – assuming full pass-through of the price increases at the gas pump – results in a range of possible gasoline price increases from 26 cents per gallon to \$1.26 per gallon.¹⁴ Actual average U.S. pump prices rose from \$1.41 in late 2002 to \$1.72 in March – the highest nominal price ever observed.

¹⁴ Spikes in oil prices obviously hurt the consumer directly at the pump or accepting delivery of home heating oil, but sharp increases in energy prices have broader economic effects beyond the scope of this report. For some discussion of the macroeconomic effects of oil price shocks, see CRS Report RL31608, *The Effects of Oil Shocks on the Economy: A Review of the Empirical Evidence*, by Marc Labonte.

Figure 7 below shows gasoline prices as well as crude oil prices during the recent past. It shows that pump prices hovered in the \$1.40 range for much of 2002, before tracing the upward path of rising crude prices. It also shows that as the fighting in Iraq wound down, so did both crude and gasoline prices.

Figure 7. Gasoline and Crude Oil Prices, May 2002 - April 2003



Iraq Oil Production Under a New Regime

The *International Petroleum Encyclopedia 2001* reports that Iraq has proven crude oil reserves of 112.5 billion barrels, second only to Saudi Arabia's 259 billion barrels. The country's resource potential may well be far greater than this amount, since large areas have never been explored. Additionally, little new activity to prove new reserves in and around known oil fields has been undertaken for decades.

Iraq's production comes from 1,685 wells in 20 fields; in 1991 Iraq had 1,511 wells, which sustained a greater production than today. Some of these oil fields are Prudhoe Bay-sized. Nearly all these fields were discovered during 1927 to 1978. Sustainable production capacity is currently estimated at 2.8 million barrels per day.¹⁵ Were existing facilities to be repaired and brought up to design capacity, ultimate capability would likely be in the 3.3 mbd range, a figure last seen just before the start of the 1990-91 Gulf Crisis¹⁶. But this amount of production is constrained by lack of maintenance of both production wells and transport infrastructure. That such a large

¹⁵ *Iraq Country Analysis Brief*, March 2002. DOE/EIA. Page 5.

¹⁶ EIA, *Country Analysis Briefs: 1994*. Page 43.

amount of production can result from so few wells is noteworthy, suggesting that Iraq's geology is highly productive. In contrast, Texas produces 1.4 mbd from 166,000 wells.

The implications of this depiction of Iraq's resource base are considerable. With an infusion of modern methods and equipment, Iraq could become a potent oil producer and exporter, with enough output potential to change the supply-demand status quo in the world oil market. This could drive prices down substantially, to the benefit of consumers. Assuming that Iraq would remain in OPEC, the additional supply could prove difficult for the cartel to accommodate.

Whatever political and policy changes take place in Iraq, it holds massive oil reserves and a great deal of additional potential, perhaps enough to rival Saudi Arabia's resources and production capability. *Platt's Oilgram News* states that "... proven and probable reserves could top 300 billion [barrels] if all unexplored acreage is drilled, leapfrogging Saudi Arabia into the slot as the holder of the world's biggest reserves."¹⁷ Saudi Arabia has proven reserves of 259 billion barrels.¹⁸ This could position Iraq as the world's most important source of incremental supply, potentially enabling a challenge to the Saudi position within OPEC. Were this to take place, Iraq might become a major determinant of world oil prices.

It has been a goal of U.S. energy policy to diversify sources of oil supply, and were Iraq's oil potential to be fully brought on stream, the global supply pattern would be dramatically altered. From a U.S. energy policy perspective, many experts believe it would be desirable to have another large supplier feeding the world market and providing price competition for Saudi Arabia.

Some observers speculate that the Saudis may be concerned about this possibility. For example, in 1998, Saudi Arabia announced an interest in having foreign oil companies participate in the development of its huge and largely untapped natural gas reserves, a project of a \$25 billion scope. ExxonMobil and Royal Dutch Shell have been in continuous negotiations with the Ministry of Petroleum ever since. But Majid al-Moneef, an advisor to the Ministry, was recently quoted by Bloomberg during a meeting of the Russia-Saudi intergovernmental commission of economic cooperation as indicating that there might be a role for Russian companies that had not been publicly discussed. "Russian companies can be part of the investment process, especially in gas," al-Moneef said in an interview. "There can be many gas projects, open to Russian companies as well as to others. Russian oil and gas companies have expressed an interest."¹⁹

Russian interest in the outcome of the impending developments in the Persian Gulf region goes far beyond its firms' contracts to supply oilfield services in Saudi

¹⁷ *Platts Oilgram News*. "After any war with Saddam's Iraq, the next battle may be for control of oil potential." October 11, 2002, page 4.

¹⁸ *International Petroleum Encyclopedia 2002*, page 91.

¹⁹ Saudi Arabia May Invite Russians to Develop Gas Fields. Bloomberg.com, Energy News, October 15, 2002.

Arabia and Iraq, where Russian oil companies held a long-term contract for oil field development until Iraq cancelled it in December 2002.²⁰ Because energy – mostly crude oil and natural gas – supplies 40% of Russia's exports and 13% of the nation's gross domestic product (GDP), its economy is extremely sensitive to oil prices.²¹ Russia is the world's second-largest oil producer, and its economic well-being is inseparably tied to high oil prices. Regarding negotiations with Russia over its Iraq stance in the event of military activity, the *Washington Post* recently reported:

Russian officials say they have reached an understanding with the Bush administration on Russia's economic interest in Iraq, including concerns about the plummeting price of oil as a result of an Iraqi oil boom should President Saddam Hussein be overthrown. While vigorously denying that there has been a specific agreement, U.S. officials say they are aware of Russian concerns and are taking them into account in planning for a post-Hussein Iraq.²²

The *Post* continues:

At the top of [Russian President Vladimir] Putin's list of economic concerns is fear of collapsing oil prices once U.N. trade sanctions against Baghdad are removed and Western investment begins to pour into the neglected Iraqi oil sector. According to [one] estimate . . . a \$6 fall in the price of a barrel of oil would slash Russian economic growth in half.

A similar situation exists in Saudi Arabia, the world's largest oil producer. About 40% of GDP and 70%- 80% of government revenues come from oil export revenues.²³ Were oil prices to drop dramatically, government revenues would fall; so would the rate of growth for the economy as a whole. Slower economic growth would not be good news for a country with rapidly increasing population, many of whom cannot find jobs outside the public sector. To some extent, political stability in Saudi Arabia is contingent on an increasing long-term flow of oil revenues.

Policy Responses to Market Disturbances

As noted in the preceding analysis, the military conflict in Iraq resulted in a relatively small shortfall to the world market. Lost Iraqi supplies were largely made up by other exporters. Prices rose during the period of readjusting supply arrangements, as they did during the 1990-91 Gulf Crisis, and then declined to pre-crisis levels. Prices have since followed the same general pattern seen in past experience, with crude increasing to the \$40 per barrel area, followed by a

²⁰ Lukoil angered by Iraqi cancellation of Qurna contract. *Platts Oilgram News*, December 13, 2002. Page 1.

²¹ *Russia–Country Analysis Brief*, November 2002, at the U.S. Department of Energy web site [<http://www.eia.doe.gov/emeu/cabs/russia.html>].

²² Russian Oil Fears Play in Iraq Policy: Moscow Neutrality During War Sought, *Washington Post*, November 22, 2002, page 1.

²³ Saudi Arabia Country Analysis Brief, October 2002, at the U.S. Department of Energy web site [<http://www.eia.doe.gov/emeu/cabs/saudi.html>], page 1.

readjustment to the low-to-mid \$20 range that prevailed before the run-up. However, as noted above, other scenarios leading to much greater supply disruptions had also been postulated.

Several policy tools at the nation's and Congress' disposal could be invoked to replace lost supplies, help blunt price increases, or provide relief to individuals and families adversely affected by high prices. As noted earlier, OPEC producers proved willing to make up for supply shortfalls during the armed conflict with Iraq and the loss of Iraqi exports to the market. However, had a prolonged shortfall to world oil markets occurred, the option with the greatest potential in the short term would almost certainly have been the Strategic Petroleum Reserve (SPR), which has an initial drawdown rate of 4.3 million barrels per day.

The Northeast Heating Oil Reserve (NHOR) was created mainly to deal with shortages of home heating oil in New England owing to extremes of weather or temporary inadequacies in refinery production. However, the NHOR could be tapped as well to compensate for shortages rooted in military conflict overseas. An additional program already in place is the Low Income Home Energy Assistance Program (LIHEAP). Other options that have been explored in the past include enacting a moratorium on motor fuel excise taxes, and reimposing a ban on oil exports.

These short-term policy options are discussed below because they would make use of existing programs or would involve legislative action that has recently been debated in Congress. Other short-term options that may have been discussed or implemented in the more distant past, such as emergency consumption curtailments and price controls, are not included here.

Episodes of price and supply instability generally also prompt a focus on longer-term options that will either boost U.S. oil production, promote the diversification of sources of supply to U.S. markets, or reduce consumption. For example, tightening of corporate average fuel economy (CAFE) standards for motor vehicles was a major issue in the debate over comprehensive energy legislation in the 107th Congress. Diversification of U.S. sources for imported petroleum was a major element of the Bush energy plan released in 2001. Because of that recent interest, these long-term policy options are briefly reviewed as well.

Short-Term Policy Options To Replace Supply or Provide Price Relief

Diplomacy and "U.S. Intrusion" With OPEC Producers. Before the cutoff of Iraqi exports, major OPEC producers expressed willingness to make up for the lost supply, without overt U.S. pressure. This was one of the Clinton Administration's major initiatives when prices rose during 1999 and supply tightened going into the winter of 1999-2000. The Clinton Administration diplomatic effort is recapped below.

When OPEC adjusted production quotas of member nations in March 1999, crude supply was reduced by roughly 2 mbd from prior levels of production.²⁴ By early 2000, the resulting supply imbalance from the production cuts was one contributing factor to a rise in crude prices as high as \$32/bbl – significantly above the level targeted by OPEC at the March 1999 meeting.

With OPEC scheduled to meet on March 27, 2000, Secretary of Energy Richardson embarked on several diplomatic missions in the preceding weeks, meeting with energy ministers and key leaders in Saudi Arabia, Kuwait, Venezuela, Norway and Mexico. (The latter two nations are not OPEC members but participated in the coordinated production cutback.) Secretary Richardson's announced intent was to convince the nations he visited – which, combined, had surplus production capacity of about 4 mbd – that the sharp runup in prices and volatility in world oil markets threatened the generally upbeat international economic climate.²⁵

Upon his return, Richardson testified before the House International Relations Committee on March 1, 2000, suggesting that this trip of “quiet diplomacy” was successful. On March 28, 2000, OPEC announced that production would be boosted roughly 1.45 mbd. However, this policy – whether quiet or not – fomented reactions by one prominent producer and in the U.S. Congress.

Iran took exception to what it viewed as American intrusion into OPEC's deliberations, and initially refused to be a party to the agreement. However, Iran announced that it would not sacrifice market share and would boost its production.²⁶

At a Senate hearing on March 2, before OPEC announced its production increase, Senator Murkowski challenged why OPEC would not advance the timetable for a decision. “They could hold that meeting [whenever] they want,” he reportedly remarked to Richardson, suggesting that “OPEC is poking you right in the eye, Mr. Secretary.”²⁷

On March 1, 2000, Representative Gilman introduced H.R. 3822, the Oil Price Reduction Act of 2000, which would have reduced, suspended or terminated “any assistance under the Foreign Assistance Act of 1961 and the Arms Export Control Act to each country determined by the President to be engaged in oil price fixing to the detriment of the United States economy.” At the same time, the legislation included provisions expressing the sense of the Congress that the United States should continue its diplomatic efforts to persuade producer nations of the risks to the

²⁴ See CRS Report RS20487, “OPEC Oil Production – Facts and Figures.”

²⁵ “Most Oil Producers Agree on Increase: US,” appearing in *Platt's Oilgram News*, Vol. 78, No. 57, Thursday, March 23, 2000: p. 3.

²⁶ “Intervention was beyond expectation” was what one Iranian delegate was reported to have said. “OPEC Bases New Production Strategy on Price Band,” *Oil Daily*, March 30, 2000: p. 2.

²⁷ “Producer Trio Meets; Global Demand Rises,” *Oil Daily*, Vol. 50, No. 43, March 3, 2000: p. 1-2.

global economy from sustained high prices.²⁸ As reported from committee, amended, on March 15, 2000, the bill would have required the Administration to report to the Congress within 30 days of enactment on whether oil exporting nations were engaging in price fixing. If so, the bill would have further required the Administration to initiate steps to reduce, suspend or terminate assistance or arms sales to those nations.

The sanctions language was dropped from H.R. 3822 by the House Rules Committee on March 21, in response to arguments that many of these nations were important clients of the U.S. aerospace, electronic, and defense industries, and that sanctions would be ill-advised. It was also argued that the Administration already had the authority to impose sanctions under the International Emergency Economic Powers Act (P.L. 95-223). H.R. 3822 passed the House (382-38) on March 22, 2000. In the Senate, a resolution supporting U.S. diplomatic efforts (S.Res. 263) was also approved, amended, by the Senate Committee on Foreign Relations on March 8, 2000. No further action occurred.

No matter the issue, diplomacy is likely to be a policy of high preference given that it brings the principals into dialogue at high levels of leadership, and may circumvent the need to intervene in markets and minimize economic dislocation. At the same time, diplomatic initiatives may be regarded by some parties as intrusive, or may be judged by some policymakers as indecisive. Opinion may also differ about the success of diplomacy. While the OPEC meeting was still in progress in 2000, Representative DeLay reportedly characterized the amount of the anticipated boost in production as a disappointment and was sharply critical of the Administration energy policy.²⁹ Secretary Richardson declared OPEC's action to be "responsible."³⁰

Drawdown of the Strategic Petroleum Reserve (SPR). The SPR was authorized by the Energy Policy and Conservation Act (P.L. 94-163, EPCA) in 1975 to create a below-ground reserve of crude oil that could be tapped in the event of an interruption in supply comparable to the experiences of 1973-74. The SPR may also be used to replace oil intended for U.S. shores that may be diverted elsewhere in the event that the International Energy Agency (IEA) oil-sharing agreement is invoked. Under the oil-sharing agreement, IEA signatories would proportionately share the burden of a significant shortfall in world supply. As of the end of November 2002, the SPR held a record level of 593.5 million barrels, and the SPR is expected to be

²⁸ Legislation is viewable at the website of the House Committee on International Relations: see [http://www.house.gov/international_relations/GILMAN_255.PDF]

²⁹ "DeLay Slams 'Clinton-Gore Crisis,'" *Oil Daily*, March 29, 2000: p. 7.

³⁰ "NYMEX Crude Range-Bound Post-OPEC, Products Mixed Late," Reuters, Thursday, March 30, 2000.

filled to its current capacity of roughly 700 million barrels with royalty-in-kind oil.³¹ Maximum drawdown of the SPR is 4.3 million barrels per day.

EPCA authorizes drawdown of the Reserve upon a finding by the President that there is a “severe energy supply interruption.” This is deemed by the statute to exist if three conditions are joined: If “(a) an emergency situation exists and there is a significant reduction in supply which is of significant scope and duration; (b) a severe increase in the price of petroleum products has resulted from such emergency situation; and (c) such price increase is likely to cause a major adverse impact on the national economy.”

Congress enacted additional drawdown authority in 1990 (Energy Policy and Conservation Act Amendments of 1990, P.L. 101-383) after the *Exxon Valdez* oil spill, which interrupted the shipment of Alaskan oil, triggering spot shortages and price increases. The intention was to provide for an SPR drawdown under a less rigorous finding than that mandated by EPCA. This section, 42 U.S.C. § 6241(h), allows the President to use the SPR for a short period without having to declare the existence of a “severe energy supply interruption” or the need to meet obligations of the United States under the international energy program.

Under this provision, a drawdown may be initiated in the event of a circumstance that “constitutes, or is likely to become, a domestic or international energy supply shortage of significant scope or duration” and where “action taken ... would assist directly and significantly in preventing or reducing the adverse impact of such shortage.” This authority allows for a limited use of the SPR. No more than 30 million barrels may be sold over a maximum period of 60 days, and this limited authority may not be exercised at all if the level of the SPR is below 500 million barrels. Authorities governing the SPR are periodically extended by the Congress. They currently expire on September 30, 2004.

In the event of a supply emergency, a likely initial response might be to suspend any fill activities. For example, at the present time, royalty-in-kind deliveries to the SPR scheduled to the end of FY2003 would average roughly 55,000 barrels per day (though there would be wide fluctuation on a month-to-month basis).

When the nation entered a period of volatility in oil prices in 1999-2001, many policymakers advocated drawdown. The Clinton Administration opposed a drawdown of SPR oil, arguing that the situation did not fit the sort of supply problem for which the SPR was intended. Additionally, from the end of March 2000 until early November, the authorities for the SPR had lapsed. The comprehensive energy

³¹ Royalty oil is due to the U.S. government by operators who acquire and produce from leases on the federally owned Outer Continental Shelf. Under current law, royalty rates of 12.5% to 16.7% are assessed on the amount or value of production from federal leases. (Variable rates of 16.7% or more may be applied depending upon the lease sale.) The Minerals Management Service (MMS) is responsible for collecting royalties. Generally, MMS has collected royalties from federal oil and gas leases in cash, but, in 1998, it started testing the effectiveness of collecting royalties “in kind” – or in other words, acquiring a portion of the actual crude oil.

legislation debated but not enacted in the 107th Congress included provisions to permanently authorize the SPR.

The absence of a clear authority, or reluctance to find that circumstances warrant a drawdown, has not precluded use of the SPR. As the summer of 2000 ended, crude oil prices continued to escalate despite boosts in production by the OPEC cartel. Stocks of home heating oil had been at historic lows, and concern was growing about the fresh pressure that escalating crude prices, colder weather, and anticipated refinery maintenance might have on home heating oil price and supply during the winter. On September 22, 2000, President Clinton announced a swap of 30 million barrels of oil from the SPR, and contracts were awarded on October 4. Interested parties bid to borrow quantities of not less than 1 million barrels. Contracts were awarded on the basis of how much oil bidders offered to return to the SPR between August 1 and November 30, 2001. In effect, bidders based their offers on their best models of what it would cost them to acquire replacement crude, weighed against the benefit to them of having additional supply at the beginning of the winter. Although there were reports that interest in the swap was thin, this proved not to be the case. DOE awarded 24 million barrels of sweet crude, and 6 million barrels of sour. Under the contracts accepted by DOE, a total of 31.5 million barrels were to be returned to the SPR in 2001.

In the period between announcement of the swap and the day after the awards were made, crude prices softened from \$37 to less than \$31/bbl. It was arguable how much of this was attributable to the swap, or whether, absent the escalation in Middle East tensions during the week of October 9, 2000, the decrease would have occurred anyway. U.S. willingness to use the SPR might have temporarily taken the wind out of a speculative element in the futures market. Some argued at the time that the Administration announcement was a calculated political gesture to affect price, that the circumstances did not merit a drawdown of SPR oil, and that adding crude to the market would do little to boost home heating oil supply because refineries were operating at near capacity. Others contended that there was a legitimate need to call upon SPR supply, because it would increase supply and exert some stabilizing influence.

Senator Murkowski, then Chairman of the Senate Energy Committee, issued a press release on October 6, 2000, underscoring the irony that oil from the U.S. SPR might relieve European, rather than domestic markets. While it can be argued that, in a world market, it does not greatly matter where the product goes, a principal issue here appeared to be the reluctance among some European nations to draw upon their own strategic stocks. Officials in Spain and France called for a coordinated stock drawdown by the European Union in light of the U.S. action, but opinion was divided among the membership. An advantage of an European drawdown would have been that these stocks are held in the form of refined products, as well as crude, and would reach product markets faster. None, however, occurred.

The preponderant risk in the swap transaction was borne by the oil companies or refiners who placed bids. The volume a refiner promised to return, and the price at the time the refiner acquired the replacement crude, determined the refiner's effective return on participating in the swap. However, in the absence of congressional appropriations to acquire oil for the SPR in recent years, the reserves

received under the swap were a net acquisition that would not have otherwise occurred. In that sense, it is not especially material whether or not the quantity of oil returned to the SPR is at price parity with the quantity originally borrowed. On March 29, 2001, the repayment schedule was renegotiated to allow five companies to return nearly 24 million barrels of the swapped oil between December 2001 and January 2003. In mid-December, five companies still owing roughly 6.5 million from the swap renegotiated delivery in light of the drop in crude exports from Venezuela. Delivery of swapped oil is now scheduled to be completed by the end of FY2003.³² The projected total to be returned under the swap will be over 33.5 million barrels. (For additional information, see CRS Issue Brief IB87050, *Strategic Petroleum Reserve*.)

Drawdown From the Northeast Heating Oil Reserve (NHOR). The FY2001 Interior Appropriations Act (P.L. 106-291), signed into law on October 11, 2000, provided \$8 million to fund establishment and fill of a Northeast Heating Oil Reserve (NHOR). Legislation to formally authorize the NHOR (P.L. 106-469) was enacted November 9, 2000. The NHOR, with sites in New York and New Jersey strategically situated to serve New England in the event of shortages, holds 2 million barrels of home heating oil. The Energy Policy and Conservation Act (EPCA, P.L. 94-163) included authority for the Secretary of Energy to establish regional reserves as part of the broader Strategic Petroleum Reserve.

Controversy over the regional reserve, and the language that would govern its use, was caught up in differences between the House and Senate over extension of the EPCA authorities in 2000. Opponents of establishing a regional reserve suspected that it might be tapped at times that some consider inappropriate, and that the potential availability of the reserve could be a disincentive for the private sector to maintain inventories as aggressively as it would if there were no reserve. One critic of the proposal, the Petroleum Industry Research Foundation, predicted that “aggressive use of a government reserve to hold down prices would hold down the supply response as well.” However, advocates of the regional reserve pointed out that the experience of the 1999-2000 winter demonstrated how the problems experienced in the Northeast can quickly generalize into associated increases in the price of other petroleum fuels. They argued that the benefits from measures that prevent the sort of price increases experienced in home heating oil ultimately are shared by consumers of diesel fuel and gasoline, too.

P.L. 106-469, the NHOR authorization statute, allows drawdown if there is a regional supply shortage of “significant scope and duration,” or if – for seven consecutive days – the price differential between crude oil and home heating oil increases by more than 60% over its five-year rolling average. The intention is to make the threshold for use of the regional reserve high enough so that it would not discourage oil marketers and distributors from stockbuilding.

During mid- and late December 2000, the 60% differential was breached. However, this was due to a sharp decline in crude prices rather than to a rise in home

³² “US Allows Delay in Supplying Oil to SPR,” appearing in: *Platts Oilgram News*, Tuesday, December 17, 2002, p. 1.

heating oil prices. In fact, home heating oil prices were drifting slightly lower during the same reporting period. As a consequence, while the 60% differential was satisfied, other conditions prerequisite to authorizing a drawdown of the NHOR were not. By February 2001, heating oil stocks had recovered sufficiently to ease any serious concerns about adequacy of supply during the remainder of that winter.

DOE updates and posts a table weekly, available on its web site [http://www.fe.doe.gov/heatingoil/heatingoil_salebasis.shtml], which shows the various inputs that go into the calculation to determine the current differential. The threshold for use of the home heating oil reserve was not breached during the winter of 2001-2002. At the moment, absent any significant disturbance in oil price or supply, use of the NHOR appears unlikely during the winter of 2002-2003. However, it is there if needed.

The NHOR is designed to provide relief from weather-related shortages for approximately 10 days, which is the time needed for ships to bring heating oil from the Gulf of Mexico to New York Harbor. If drawdown of the NHOR were coordinated with drawdown of crude from the SPR to tide the Northeast over until new refined product could reach the region, the NHOR could be an effective tool. It cannot, however, be a long-term replacement for a shortfall in supply. (For additional information on the establishment of the NHOR, see CRS Report RL30781, *U.S. Home Heating Oil Price and Supply During the Winter of 2000-2001: Policy Options.*)

In lieu of establishing a separate federally managed home heating oil reserve, legislation was proposed during the 106th Congress by Senator Kennedy that would have ensured that “minimally adequate” heating oil stocks be accumulated to meet “reasonably foreseeable demand during each winter while protecting consumers from sudden increases in the price of home heating oil.” The Stable Oil Supply (SOS) Home Heating Act (S. 2094), would have required importers, wholesales and refiners to act in concert or individually to develop voluntary plans that would be submitted to the Secretary of Energy describing the actions they were taking to “mitigate the risk of severe price increases.” If the Secretary did not certify a plan as acceptable, the Department of Energy would impose a plan and could require the principals to hold specific levels of inventory.

Opponents of the bill contended that it would have imposed a costly burden on oil marketers and interfered with market efficiency. Proponents argued that vesting this responsibility in the private sector has the least costs administratively. Additionally, they argued that any slight upward pressure on prices that resulted from advance purchases to meet inventory goals should be seen as analogous to an insurance premium, a prudent investment in preventing any repetition of the volatilities experienced during the winter of 1999-2000. This approach might be pursued as a separate initiative if circumstances appear to warrant at a future date.

International Energy Agency. The United States and its industrialized allies established the International Energy Agency (IEA) in 1974 – in response to the Arab oil embargo – to coordinate their energy policies and mitigate severe supply disruptions. Membership in the IEA obligates countries to maintain commercial or government-owned stocks equivalent to 90 days of net imports. These requirements

may be met with a combination of stocks held by industry, governments, or public- or private-sector agencies that have been created for the purpose of holding stocks. This requirement may also be satisfied with demand restraint and fuel switching. The 26 current IEA members are also obliged to have demand restraint programs that can be used to reduce consumption, and to participate in oil allocation among IEA signatories in the event of a particularly severe disruption.

In the event of an emergency, the IEA Governing Board convenes to consider an appropriate response. IEA last activated its contingency plan in January 1991 following the commencement of the air war on Iraq. Demand restraint comprised 300,000 barrels per day, and stock drawdown was slightly more than 2 mbd.

Periodically, representatives of the IEA nations conduct a test coordinated stock drawdown, the most recent of which was held in March 2002. IEA estimates that its members hold a total of nearly 4 billion barrels, representing about 114 days of net imports.³³ IEA estimates that approximately two-thirds of IEA stocks are held by the petroleum industry and the roughly one-third balance is held by governments and agencies. The maximum drawdown of IEA stocks is estimated at 12.9 mbd for one month, which would include 9.6 mbd of crude and 3.3 mbd of “products,” which assumes demand restraint and fuel-switching. Even if a drawdown equivalent of this magnitude could be achieved at any point, it could not be maintained.

Stock drawdown was not an option in the early years after establishment of the IEA because nations had no stockpiling programs. An oil-sharing plan developed shortly after the establishment of the IEA provided instead for the potential diversion of oil shipments from their original destinations for the purpose of allocating the shortage proportionately among all IEA members. However, demand restraint and stock drawdown are now the clear option of preference and first resort for nearly all the IEA signatories.³⁴

Low Income Home Energy Assistance Program (LIHEAP). The Low-Income Home Energy Assistance program (LIHEAP), originally established in 1981 by Title XXVI of P.L. 97-35 and reauthorized several times, is a source of financial assistance to low-income households adversely affected by high energy costs for residential heating or cooling. LIHEAP is a block grant program under which the federal government gives states, the District of Columbia, U.S. territories and commonwealths, and Indian tribal organizations annual grants for needy households. It is currently authorized through FY2004. The last release of LIHEAP funds, on August 9, 2002, was to provide emergency contingency funds to meet energy needs in those states most affected by the extreme heat.

For FY2003, LIHEAP was funded at \$1.8 billion, plus an additional \$200 million in contingency funding released in January 2003.

³³ Information cited in this section is reported in: International Energy Agency. Fact Sheet. IEA Stocks and Emergency Response. 2000 [<http://www.iea.org/about/files/factshee1.pdf>]. Additional information provided in a telephone conversation with Leonard Coburn of DOE.

³⁴ For a helpful discussion of the IEA, see: *Rethinking Emergency Energy Policy*, December 1994.

In the event of a sustained price spike, and if the Congress wished the Administration to have the option to use LIHEAP as a major conduit for consumer relief, it could fund the program at higher levels, or expand the scope of assistance. However, any significant expansion of the program would raise budget issues. (For additional information, see CRS Report 94-211, *The Low-Income Home Energy Assistance Program (LIHEAP)*).

Moratorium on Motor Fuel Excise Taxes. In the late winter and early spring of 2000, policymakers in the 106th Congress focused on possible tax options to address a recent spike in petroleum prices, including a moratorium on the payment of gasoline and diesel fuel excise taxes. The idea was rejected primarily because – unless Congress made some other provision – revenues from these taxes paid to the Highway Trust Fund (HTF) would have declined significantly. A review of the debate, however, is useful, given that the same issues would likely arise were the policy option revisited in the event of military conflict in the Middle East. It is also possible that a higher and more sustained spike in prices might overcome some of the resistance that led the 106th Congress to not enact motor fuel tax suspension.

Virtually all transportation fuels are taxed under a complicated structure of tax rates and exemptions that vary by mode and type of fuel. Gasoline used in highway transportation — the fuel used more than any other — is taxed at a rate of 18.4¢ per gallon, composed of an 18.3¢ Highway Trust Fund rate, which goes into the HTF, and a 0.1¢ rate that is earmarked for the Leaking Underground Storage Tank Trust Fund (LUST).³⁵ The gasoline tax, the single largest source of revenue for the HTF, is projected by the U.S. Treasury Department to yield \$19.3 billion for FY2003. Most of that revenue goes into the “highway account” to be used for highway construction and maintenance (precisely 15.44¢/gal. of the 18.3¢ tax goes into the highway account); 2.86¢ are allocated to the “mass transit account,” to be used for capital expenditures on mass transit systems.

Diesel fuel for highway use — the second most commonly used highway fuel, used mostly by trucks — and kerosene to the extent that it also is used as a highway fuel, are taxed at 24.4¢ per gallon, 6¢/gallon more than gasoline.³⁶ The tax on kerosene used on the highways was added as part of the Taxpayer Relief Act of 1997, in order to reduce tax evasion. Kerosene and diesel (also called distillates) used as heating oil get a full refund or tax credit. The highway tax on diesel (and kerosene) fuel also comprises two components: a 24.3¢ rate that is allocated to the HTF, and 0.1¢ that goes to the LUST fund. Unlike gasoline, however, which is largely consumed for personal use, diesel fuel is used primarily in trucks that transport goods; i.e, it is primarily used by businesses. Gross revenues from the diesel tax were projected to be about \$7.2 billion in FY2003. However, as this tax is a cost of

³⁵ The LUST fund finances the cost of cleaning up spills from underground fuel storage tanks.

³⁶ In addition to gasoline and diesel fuel, special motor fuels (gasoline substitutes), jet fuel, railway diesel fuel, motorboat fuel, and virtually every other transportation motor fuel that is not specifically exempt are also subject to tax. Compressed natural gas (CNG) has, since 1993, been subject to an excise tax of 48.54¢ per mcf (thousand cubic feet) — marking the onset of the taxation of gaseous transportation fuels.

doing business for truckers, it is deductible against income taxes so that the net revenue yield to the federal government — i.e., the net cost to truckers — is smaller by about 25%, according to the Joint Committee on Taxation, the official scorer on such matters. Thus, net revenues in FY2003, including offsets, are projected at about \$5.4 billion. Revenues from 2.86¢ of the tax are also allocated for mass transit; revenues from the remaining 24.3¢ HTF component (21.44¢) go into the highway account.³⁷ Truckers also pay three other federal excise taxes, whose revenues also go to the HTF and are tax deductible.

As high crude oil costs persisted in 2000, the increases that first surfaced with home heating oil became increasingly generalized to all fuels. Some Senators proposed to suspend until the end of 2000 the 4.3¢/gal increment of the federal excise tax on gasoline that was added in 1993. The additional revenues were originally designated for deficit reduction, but were later redirected by the Taxpayer Relief Act of 1997 (P.L. 105-34) to a transportation trust fund. Under the Senate proposal, if the national average price for regular unleaded gasoline were to exceed \$2 per gallon, the full excise tax of 18.4¢/gal would be lifted on gasoline, as would the 24.4¢/gal excise tax on diesel fuel, and 4.3¢/gal tax on aviation fuel. The HTF would be reimbursed from the budget surplus for the lost revenue. A cloture motion to bring this measure (S. 2232) to the floor of the Senate failed (43-56) on April 12, 2000.

Legislation in the House, H.R. 3749, proposed to reduce the tax on gasoline, diesel, and kerosene by 10.0¢/gal (the tax on gasoline would be 8.4¢ and the tax on diesel and kerosene would be 14.4¢). Under this bill, the estimated revenue loss would have been made up from general revenues so the HTF would not lose money. Another bill, S. 2161, would have required the Secretary of the Treasury to transfer amounts from the General Fund to the HTF to cover funds not received as a result of any moratorium and reduction in tax collections. In the absence of Senate passage of tax suspension legislation, there was no House action.

Congressional attention had initially focused upon enacting some form of tax relief for truckers hard hit by diesel fuel increases. One proposal, S. 2090, would have provided for a one-year moratorium on the 24.3¢ HTF component of the 24.4¢ tax on diesel, and a permanent reduction in the tax to 4.3¢ beginning on October 1, 2005. However, as the debate continued, it appeared that singling out one fuel for tax relief might introduce into the market a fresh distortion affecting the relative prices of home heating oil and diesel fuel. Whether such a measure would lead to a smaller or larger price differential between the two fuels, or whether some increment of the tax reduction might be netted from home heating oil prices rather than exclusively applied to diesel, is difficult to predict. The effect of a tax moratorium on prices might also be affected by seasonality of demand for home heating oil.

³⁷ A variety of off-highway fuel uses (e.g., farming), business uses (e.g., construction equipment), and government uses (e.g., police departments and school districts) are tax exempt.

States could compensate for lost revenues from the HTF by raising the state tax on fuel. However, whether they would, in the short term, compromise or defeat the objectives of any proposed federal legislation is not clear.³⁸

Another issue would be equity. The various motor fuels excise taxes act as a quasi-user fee, a charge for the benefits received by taxpayers from their use of the interstate highways and highway infrastructure, and the revenues are used to build and maintain that infrastructure. To the extent that charges approximate individual benefits received, relieving the tax burden for truckers might have been viewed by some as inefficient and inequitable vis-a-vis gasoline consumers who would not be granted comparable relief. (For additional background on the taxing of transportation fuels, see CRS Report *RL30497: Suspending the Gas Tax: Analysis of S. 2285*; CRS Issue Brief IB10054, *Energy Tax Policy*; CRS Report RS20521, *Transportation Fuel Taxes: Impacts of a Repeal or Moratorium*, March 27, 2000; and CRS Report RS20281, *Transportation Fuel Taxes and Legislative Issues*, October 6, 1999.)

Reimposition of the Ban on Alaskan Oil Exports. During the 1999-2001 period of tight supplies and volatile prices, there were legislative proposals to prohibit any exports of petroleum from Alaska, which had averaged roughly 74,000 barrels per day, or about 7% of Alaskan production. The Trans-Alaska Pipeline Act of 1973 (PL. 93-153) prohibited the export of North Slope oil transiting the pipeline right-of-way. In 1995, against a backdrop of low oil prices and plentiful global supply, P.L. 104-58 permitted North Slope crude exports. This law did not inhibit the President's authority contained in other law to suspend these exports in the event of a national emergency. Exports began and continued without expression of concern or market disruption until price and supply difficulties began to develop in 1999. Legislation was introduced in the House (H.R. 4007, H.R. 4017) and Senate (S. 2275) that would have temporarily suspended, or reimposed the ban on, Alaskan exports.

Currently, however, no Alaska North Slope (ANS) crude oil is being exported. In May 2000, BP Amoco and Arco merged. As part of the transaction, Arco's one-third stake in ANS operations was sold to Phillips. BP Amoco is running the formerly exported crude in the California refineries that it acquired in the Arco deal. Phillips does not export Alaskan oil at present and reportedly has no plans to do so³⁹. (For additional background, see CRS Report RS20540, *Alaska Oil Exports*.)

Overall U.S. oil exports have averaged less than a million barrels per day during January-September 2002.⁴⁰ These exports are primarily of less desirable fuels, including bunker fuel for ships and petroleum coke. In a fluid world market, any sort

³⁸ Most states impose excise taxes that average about 20¢/gallon, making the total federal and state excise taxes a significant fraction of the market price of gasoline and diesel fuel. See: U.S. Department of Transportation. Federal Highway Administration. *Highway Statistics: 1998*. Publication # FHWA-PL-99-017. October 1999. IV-46.

³⁹ *Platts Oilgram Price Report*, March 24, 2000.

⁴⁰ [http://www.eia.doe.gov/pub/oil_gas/petroleum/data_publications/petroleum_supply_monthly/current/pdf/table5.pdf]

of generalized ban on petroleum exports from the United States is unlikely to have any measurable effect on U.S. supply.

Long-Term Policy Options to Reduce Consumption Or Enhance Supply

Raising or Broadening the Corporate Average Fuel Economy (CAFE) Standards. The Energy Policy and Conservation Act of 1975 (P.L. 94-163) established corporate average fuel economy (CAFE) standards for new passenger cars and light trucks. The current standard is 27.5 mpg for passenger automobiles and 20.7 mpg for light trucks, a classification that also includes sport utility vehicles (SUVs). Light trucks, which tend generally to achieve less fuel economy than typical passenger cars, have put additional pressure on gasoline demand and have increased U.S. vulnerability to price increases when supplies are tight. The proportion of the new vehicle fleet that is made up of light trucks has grown from roughly 20% in 1980 to more than 50% in 2001.⁴¹ However, from FY1996-FY2001, Congress included language in the Department of Transportation Appropriations legislation to prohibit expenditures for any rulemaking that would make any adjustment to the CAFE standards, such as to raise the fuel economy standards on light trucks.

This changed in the 107th Congress. The Senate conferees to the FY2001 Department of Transportation Appropriations insisted upon a study of CAFE by the National Academy of Sciences (NAS). That study, released on July 30, 2001, concluded that it was possible to achieve a more than 40% improvement in light truck and SUV fuel economy over a 10-15 year period at costs that would be recoverable over the lifetime of vehicle ownership.

Comprehensive energy legislation debated in the House and Senate included provisions that would have influenced vehicle fuel economy. The House version of H.R. 4 called for a reduction of 5 billion gallons in light-duty truck fuel consumption over the period of model years (MYs) 2004-2010. On March 13, 2002, the Senate voted (62-38) in its version of the energy bill to charge the National Highway Traffic Safety Administration (NHTSA) with development of new CAFE standards. The Senate then approved an amendment (56-44) to freeze “pickup trucks” at the current light truck standard of 20.7 mpg. The conferees on the bill agreed on September 19, 2002, to the House-passed goal of saving 5 billion gallons, but shifted the window to MY2006-MY2012. The 107th Congress ended without final action on the bill.

Whether the 108th Congress will include fuel economy in any final version of comprehensive energy legislation is unclear. As noted, the FY2001 DOT Appropriations left NHTSA unshackled to undertake a rulemaking with respect to CAFE. On April 1, 2003, NHTSA issued a final rule to raise the CAFE standards for SUVs and light-duty trucks by 1.5 mpg during the period of MY2005-MY2007 –

⁴¹ Ward’s Automotive Yearbook, 2002.

21.0 mpg in MY2005, 21.6 mpg in MY2006 and 22.2 mpg in MY2007.⁴² Environmentalists criticized the rule for being insufficient while the automotive industry suggested that meeting the proposed standards will be a challenge.⁴³

(For additional information, see CRS Issue Brief IB90122, *Automobile and Light Truck Fuel Economy: The CAFE Standards* and CRS Report RS20298, *Sport Utility Vehicles, Mini-Vans and Light Trucks: An Overview of Fuel Economy and Emissions Standards*. Raising CAFE is also one of three gasoline consumption reduction measures discussed in a recent Congressional Budget Office study, *Reducing Gasoline Consumption: Three Policy Options*, November 2002.)

Policies to Boost Domestic Production. Whether they are concerned about the repercussions of military activity in the Middle East, or about the fact that U.S. dependence on imported oil exceeds 50% of consumption, some policymakers argue that there should be ongoing efforts to boost domestic energy production. High prices, it can be argued, will encourage additional domestic production, but the course of oil prices over time is difficult to predict. A review of the path of oil prices since the oil embargo of 1973-74 suggests that unstable, high prices have been episodic. Amidst such uncertainty, it reportedly has been difficult for the oil industry to commit to long-term investments in higher-cost technologies. At the same time, there is little that the United States can do to appreciably reduce its dependence on imported petroleum.

Proposals to boost domestic production generally prompt comment from some policymakers that there are other initiatives – conservation and alternative fuels – that will achieve greater savings than the additional production that would result from other policies. The National Energy Plan released by the Bush Administration on May 16, 2001, was criticized by some for appearing to be predisposed toward boosting production in preference to reducing oil consumption. Chief among the proposals generating controversy was a call for oil and gas leasing in the Arctic National Wildlife Refuge (ANWR).

Other policies that have been debated in the past to encourage domestic production have included a range of tax incentives. Spare capacity of the Strategic Petroleum Reserve is also being filled with domestic oil as royalty-in-kind payment to the federal government. The 106th Congress enacted a guaranteed loan program to assist domestic producers (P.L. 106-51).

Comprehensive energy legislation debated during the 107th Congress included several tax provisions intended to boost production from marginal wells, extension of suspension of the percentage depletion allowance on marginal oil and gas wells through the end of 2006, and extension of a credit for each barrel (or equivalent) for production from unconventional sources. The House bill included language to open ANWR for leasing; the Senate legislation did not. The 107th Congress adjourned

⁴² See: U.S. Federal Register. *Light Truck Average Fuel Economy Standards Model Years 2005-07*, Vol. 67, No. 241, Monday, December 16, 2002: p. 77015.

⁴³ See: *Light Truck Fuel Economy to Rise 1.5 MPG; Greens Blast Measure*, Chemical Week Associates, Vol. 17, No. 49, December 17, 2002.

without taking final action on the bill, but similar omnibus legislation is being considered in the 108th Congress. (For further discussion and analysis of such options, see CRS Report RL30290, *Domestic Oil and Gas Producers: Public Policy When Oil Prices Are Volatile*. For a review of past debates over ANWR, see CRS Issue Brief IB10094, *Arctic National Wildlife Refuge: Legislative Issues*. See also: CRS Report RL31278, *Arctic National Wildlife Refuge: Background and Issues*, June 11, 2002.)

The National Energy Plan did express the importance of production increases worldwide and especially outside of OPEC and made recommendations. For example, the Administration has directed the Secretaries of State, Commerce and Energy to develop closer energy integration with Canada and Mexico, and to provide support to American energy firms competing in markets abroad. Here, the role for Congress may be relatively limited.