

**Dawn in the Desert:  
Why Crude Oil Prices Will Likely Remain Low for Years**

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John Wiley and Sons published *Twilight in the Desert* in 2005. The book's author, Matthew Simmons, contends the world will confront very high and rising oil prices shortly because the capacity of Saudi Arabia, the world's largest oil producer, is insufficient to meet the future needs of oil consumers. In 448 pages, Simmons extensively discusses his views regarding Saudi Arabia's future production levels. He asserts that the Saudis have refused to provide public details about their reserves, insinuating at several points that the Kingdom's leaders withhold information to keep the truth from the public.

At its core, Simmons' book is no more than a long exposition of the peak oil theory first espoused by King Hubbert in 1956. Hubbert, it may be recalled, studied the pattern of discovery of super giant oil fields. His review led him to conclude that world productive capacity would peak and then begin to decline. In 1974, Hubbert suggested the global zenith would occur around 1995.

Simmons and other adherents to the "peak oil theory" enjoyed great prominence in the first half of 2008. Again and again, one read or heard that the oil price rise was occurring because the flow from world oil reserves had reached or was approaching the maximum while demand was still growing. Here's what one economist wrote just as prices peaked:

Until this decade, the capacity to supply oil had been growing just as fast as demand, leaving plenty of room to expand production at the first sign of rising prices. In the last few years, however, supplies have not been keeping pace, thanks to problems ranging from mismanagement (Mexico, Venezuela, and Iran) to violence (Iraq and Nigeria) to depletion of older fields (the United States, Norway,

and Indonesia). Today, only Saudi Arabia has capacity to significantly increase production in the short run.<sup>1</sup>

In November 2008, the IEA warned that hundreds of billions needed to be invested in the world's oil infrastructure to keep prices from surging. While not espousing the Hubbert theory, the agency's economists still cautioned that global oil output would shrink if such infusions were not made.

The phrase "twilight in the desert" cleverly captures the decline projected for global oil output and the anticipated price rise. In Simmons' view and no doubt that of many other peak oil adherents, Saudi Arabia was approaching the end of its role as the world's incremental oil producer just as many other firms and individuals were reaching the twilight of their roles.

The first part of this paper (appropriately titled "Dawn in the Desert") counters the arguments of those who rely on the Huppert/Simmons peak oil theory to explain the 2007-2008 crude oil price rise. I demonstrate here that the oil price increase resulted from badly implemented economic regulation along with Saudi Arabia's subtle but effective management of the world oil market. I assert that crude oil prices would never have passed \$60 per barrel had the energy and environmental policies set in 2006 not been so incompetent. Furthermore I suggest that crude oil prices could easily have remained below \$40 had the oil market been competitive rather than operated as a "quasi" cartel. In reviewing the events of 2007 and 2008, I also show that, contrary to the arguments of many, speculation played no role in the oil price rise.

The second portion of the paper examines the future, which I label the "new dawn." Changing economic circumstances will, I suggest, lay a foundation for a prolonged period of relatively low crude prices. I show that oil prices could easily stay in the \$30 to \$50 per barrel range for years, contrary to opinions put forward by peak oil enthusiasts. I also suggest there is a non-trivial risk of oil prices once again falling below \$10.

Oil prices will drop back to very low levels for four basic reasons. First, growth in global oil demand will be arrested by the "Bush depression." Second, the aggressive return of economic regulation will limit future growth in oil consumption. Third, the auto industry's worldwide collapse will likely provide conservation proponents the opportunity to force a rapid restructuring that will cut global oil use significantly. Fourth, Barack Obama's inauguration as president will probably result in mandates that substantially curtail U.S. oil use, which could force other countries such as China to take similar steps.

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<sup>1</sup> Severin Borenstein, "Cost, Conflict, and Climate: Navigating the Global Oil Market," *Milken Institute Review*, Fourth Quarter 2008, p. 32.

The second section also states that the Bush depression that began in 2007 will likely last until 2011. Lower global growth will lead to much lower oil use. Consumption in 2012 may be more than ten percent below levels projected less than a year ago and as much as seven percent below use in 2008.

Crude oil prices will probably remain well below the peaks reached in 2008 and most likely stay below \$70 per barrel through 2012. In fact, normal supply-and-demand forces are unlikely to ever recreate the conditions that prevailed last summer. This does not mean, though, that prices will not rise again to record levels. U.S. and EU environmental authorities have proposed regulations limiting sulfur content in the bunker fuel used in oceangoing ships by 2015. Implementing these rules could effectively block processing of roughly one fourth of the world's crude supply, limiting product availability and sending crude prices to new highs, possibly as much as \$500 per barrel.

## **I. The Rise and Fall of Oil Prices**

One now unemployed investment banker noted during the surge in asset prices that credit grows arithmetically and then shrinks geometrically. The same can be said for commodity prices, particularly oil prices. In the ten-and-a-half year period beginning January 1998, oil prices moved upward almost monotonically from \$10 per barrel, peaking above \$145 in mid-July 2008. In the following six months, they dropped 80 percent.

A single explanation cannot be found for the steady rise in oil prices, despite the best efforts of various academics. Rather, the causes are various. The first years of the price increase can be explained by OPEC actions, particularly those of Saudi Arabia. In March 1998, Saudi Arabia and Venezuela convened a joint meeting of OPEC members and the non-OPEC producers Mexico, Norway, and Russia. At the time, the price for WTI, a light sweet crude, hovered around \$10 per barrel and Middle East exporters received as little as \$7 per barrel for their crude. Saudi Arabia's oil minister proposed that the other producers join the Kingdom in cutting output. Newly elected President Hugo Chavez of Venezuela was a significant backer of the proposal. Saudi Arabia also warned the producers gathered for the meeting that it would increase production and drive prices down further if they did not cooperate.

The Saudi "offer" was accepted and prices rose steadily. For the next five or six years, OPEC focused on global inventories. In 1998, Saudi Arabia argued that the price collapse occurred when inventories rose, forcing markets into contango. In the subsequent six years, the Kingdom led a successful effort to keep markets in backwardation.

Saudi Arabia used market mechanisms to implement its strategy. Then and now, the Kingdom markets its oil to customers by setting prices relative to well-known and accepted benchmarks. It prices oil to be delivered to the United States relative to WTI, a crude oil widely traded on spot and futures markets. It prices oil bound for Europe relative to Brent, another crude traded widely in physical and futures markets. It prices oil for delivery in Asia off Dubai crude, which trades on yet another very liquid spot market.

As noted, the Saudis continue to use this pricing practice. Early each month, they announce in advance the discounts buyers will pay for oil delivered in the next month. For example, in December 2008, customers learned that the price of Arab Heavy taken in January 2009 would be \$9.50 per barrel below the WTI price for cargos destined for the United States. Then in January, buyers found they would pay \$5 less than the WTI price for Arab Heavy lifted in February.

Buyers adjust their purchases based on the discount. They buy more oil when the discount is higher and less when it is lower. The petroleum press noted, for example, that Saudi Arabia cut sales to the United States in February 2009 by 40 to 70 percent from January 2009. Some observers asserted that less oil was being delivered because Saudi Arabia reduced production. Such interpretations are incorrect. Confronted with price increases for February oil, buyers simply cut their nominations.

Other oil-exporting countries follow Saudi Arabia's lead on pricing. For example, Iran and Kuwait use the Saudi pricing formulas. As a consequence, from 1998 through 2008, Saudi Arabia and OPEC managed global inventories in general and kept prices from collapsing again. During this period, OPEC surplus capacity swung from six to three million barrels per day. Some analysts, such as Borenstein, suggest the 2008 price increases resulted from this loss of surplus capacity. They are wrong. Indeed, surplus capacity was available through all of 2008. However, the surplus available was almost all heavy, high-sulfur crude priced unattractively. As a result, much heavy crude sat idle in ships in June and July 2008 even as WTI prices touched \$147 per barrel.

The determinants of the underlying trend in global crude prices shifted from OPEC to environmental authorities in consuming countries between 2004 and 2006. The change occurred when regulations mandating sulfur removal from principal petroleum products were adopted. On President Clinton's last day in office, the Environmental Protection Agency issued regulations that required refiners to cut diesel fuel sulfur content to 10 parts per million by June 2006. In 2003, the European Union adopted similar regulations to take effect on January 1, 2009. The U.S. began adjusting to the new rules in 2005. European countries started in 2008. The new cleaner fuel is called "ultra-low-sulfur diesel," or ULSD.

The shift to ULSD placed intense pressure on markets for light sweet crude. Most refiners require light sweet crude to produce ULSD. Perhaps by coincidence, most light sweet crudes yield a high percentage of distillate fuel oil (diesel) that contains essentially no sulfur. Heavier crude oils with higher sulfur content—such as Arab Light and Arab Heavy—yield only limited volumes of high-sulfur distillate fuel. Thus the requirement to reduce sulfur in diesel boosted demand for light sweet crude.

Simultaneously, global demand was pushed higher by several macroeconomic events. The Olympics in China provided one strong stimulus. A second came from economic policies in Europe that encouraged consumers to purchase diesel-powered vehicles rather than gasoline-fueled cars. The third stimulus came from the EU's expansion. Twelve new members, all from Eastern Europe, joined in 2006. This added to diesel demand as companies moved manufacturing plants to lower-cost nations—to Poland from Germany, for example. Truck traffic surged, as did demand for ULSD. Finally, EU members must hold stocks of petroleum products in strategic reserves, and the EU boosted the requirement in 2008 even as prices surged.

During 2007 and 2008, Europe became the incremental global market for diesel. For the first time in decades, the United States became a diesel exporter. Consequently, the dollar price for the fuel was pulled higher as the euro strengthened against the dollar. Prices for light sweet crude also rose with the European diesel price. The linkage was particularly tight from August 2007 through mid-2008.

The increase in light sweet crude prices was exacerbated by output disruptions and by U.S. government action that removed supplies from the market. Nigeria is a major producer of light sweet crude, accounting for as much as 40 percent of total world supply (just 15 million barrels per day at maximum). A low-level civil war in Nigeria has blocked as much as 400,000 barrels per day of the country's output.

Theoretically, consuming nations could have replaced the lost Nigerian production by drawing down strategic stocks of sweet crude. Industrialized countries have emergency reserves that now total more than 1.5 billion barrels of crude and product. Probably one-third of this total is sweet crude. However, these nations did not draw stocks because Nigeria's problems did not meet the threshold for a disruption as defined by the International Energy Agreement. So markets were left to cope with the supply loss.

The U.S. Department of Energy made the situation worse when it decided to add crude to the Strategic Petroleum Reserve. DOE began filling the SPR in August 2007 and continued to put oil into it until July 2008, when Congress ordered it to stop. The oil price rise from \$70 to

\$147 per barrel occurred simultaneously. As part of the fill program, DOE removed approximately 30,000 barrels per day of light sweet crude from the market. This means that over eleven months DOE took about as much light sweet crude out of play as the Nigerian problems did.

The incompetent DOE officials appointed by President Bush argued that the SPR additions accounted for a very small portion of world crude demand. These officials neglected to note—or more likely never understood—that refiners would have to process as much as 600,000 barrels per day of Arab Heavy (compared to 30,000 barrels per day of light sweet crude) to replace the diesel fuel volume lost when DOE removed sweet crude from the market. They also failed to note that DOE could have moderated the price increase by selling sweet crude from the SPR.

Since July 2008, crude prices have plunged precipitously, at one point dropping to just over \$31 per barrel. The rapid turnaround can be attributed to several factors, including Congress forcing DOE to stop filling the SPR. The decrease began when the euro started weakening against the dollar and accelerated after Russia invaded Georgia. At the time, some suggested that the Russian incursion would boost oil prices. Precisely the opposite occurred, though, because the military action highlighted the EU's political weakness. The euro fell quickly by around ten percent. The dollar price for diesel dropped with the euro, as did crude prices.

The end of the 2008 Olympics added further downward pressure to diesel prices. China had accumulated stocks to assure adequate supplies. These stocks were released, reducing demand. Use in Europe also started to decline as the recession took hold there.

At the same time, light sweet crude supply increased when a new field in the Gulf of Mexico came online. Diesel supply rose at roughly the same time as refiners changed catalysts to increase production.

To conclude, then, there was no single driver behind the rise and fall in oil prices. The increase from \$10 to \$147 per barrel came about first because of OPEC actions and then because of the consuming government squeeze on light sweet crude. The combination of falling diesel demand, a boost in light sweet crude supply, and increased productive capacity for diesel fuel caused the subsequent price decline. These factors fully explain the 1998 to 2009 price cycle.

It is important to note here that speculation played no part in the price increase and decrease. During 2008, several individuals published papers suggesting that speculative activity heavily influenced the cycle. One academic, respected for his work in the area of development economics, concluded that speculation had to be behind the price cycle because no other factor could be found. His paper was nonsense, however, because the price cycle, as shown above, was

caused by factors other than speculation. It is significant that no other academic signed on to the speculation explanation. Unfortunately, international institutions such as the IEA did accept it.

Those asserting that speculators caused the price increase noted the cash flow into new commodity-linked instruments such as the S&P Goldman Sachs Commodity Index and the Dow Jones-AIG Commodity Index. The amounts invested in these indices rose from \$68 billion at the beginning of 2006 to perhaps \$250 billion in the spring of 2008. Observing this rise, many concluded that the money must be driving the crude price rise.

However, those blaming commodity indices have failed to show the necessary physical linkage between commodity prices and the investment flow. Decades of economic research have shown that commodity price manipulators must buy and hold physical inventories of a commodity to create an artificial price. For example, the Hunt Brothers gained control over a large portion of the physical silver supply. Firms that had sold short had to pay very large sums to close their positions. No such linkage has yet been demonstrated for oil.

The conclusion then is that the price rise is linked to shifts in supply and demand in the physical market. The increase began initially when OPEC members worked aggressively to limit inventories in consuming countries. Then new environmental regulations combined with inept energy policy took prices from \$70 to \$147 per barrel.

## **II. Looking Forward: Dawn in the Desert**

Oil prices will likely follow a different trajectory over the next five years. For the reasons outlined below, they will probably fluctuate between \$30 and \$50 per barrel rather than rising arithmetically or falling geometrically. While there may be occasional surges toward \$70 and plunges to \$10, the general context will be dull. This will be in sharp contrast to the breathless excitement that has dominated the market and moved market commentary to the front pages of major newspapers. For firms in the oil sector, adopting aggressive cost management programs will be the key to success.

Of course, events could change the forecast. A serious global political disruption related to war could temporarily raise prices. Prices could also be lifted if governments of producing and consuming countries worked together to stabilize them at higher levels. Such action is desirable but unlikely.

The low price environment will result from the interaction of four factors: 1) the global economic slowdown, 2) the return of aggressive economic regulation, 3) the U.S. auto industry's

impending bankruptcy, and 4) Barack Obama’s inauguration as the 44th president of the United States. The interplay of these elements will significantly reduce global energy and oil use over the next four years from levels projected only a few months ago. Global oil consumption in 2012 may fall well short of 2008 levels. The fall in demand will prevent prices from rising.

I discuss the role of each of these factors below.

### **The Global Recession: The George W. Bush Depression**

Many economists and business people view the current global economic recession as similar to, albeit more severe than, other recessions that have occurred since the end of World War II. Those holding such opinions expect to see economic recovery begin late in 2009 and well under way by 2010.

Such thinking is almost certainly a mistake. The origins of the current economic crisis (referred to here as the Bush Depression) are different from earlier episodes and the length will likely be much, much longer. In the simplest terms, earlier recessions—such as those occurring in 1973, 1980, and 1991—can be traced to a fall in demand. The current recession/depression, in contrast, has been caused by the collapse of financial institutions. Academic research reveals that recessions originating in the banking sector tend to be more severe and last longer.

The most thorough analysis and probably the best studies of the situation have been done by Carmen Reinhart and Kenneth Rogoff. Their most recent paper, “Banking Crises: an Equal Opportunity Menace,”<sup>2</sup> suggests a very sobering outlook for the future.

Reinhart and Rogoff examined banking crises in 66 developing and industrialized countries dating back to 1800. They found that crises are “equal opportunity” events, that is, they cause similar problems in developing and developed nations. Their results suggest that banking crises last more than three years. They also noted that these crises lead to large increases in government spending: “On average, government debt rises by 86 percent during the three years following the banking crisis. The fiscal consequences are thus an order of magnitude larger than the usual bank bailout costs that are the centerpiece of most previous studies.”<sup>3</sup>

(If Reinhart and Rogoff are right, the cost of resolving the current problems will range from five to nine trillion dollars. Either figure is substantially larger than the economic stimulus numbers being discussed by the Obama administration.)

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<sup>2</sup> Carmen M. Reinhart and Kenneth S. Rogoff, “Banking Crises: an Equal Opportunity Menace,” NBER Working Paper No. 14587, December 18, 2008.

<sup>3</sup> Reinhart and Rogoff, p. 3.

One of Reinhart and Rogoff's key findings was that real estate cycles around banking crises are "similar in duration and amplitude across the two groups of countries" (emerging and developed nations). They found this result surprising "given that almost all other macroeconomic and financial time series (income, consumption, government spending, interest rates, etc.) exhibit higher volatility in emerging markets."<sup>4</sup>

The Reinhart and Rogoff analysis suggests that U.S. housing prices may have much further to fall. The most common index for domestic housing prices, by Professors Case and Shiller, has already dropped 30 percent. The Reinhart and Rogoff research indicates that prices must decline another 10 to 30 percent if the historical cycle repeats.

Reinhart and Rogoff also noted key features regarding real estate that stand out in their data. First, they found that the persistence of real housing price cycles in advanced economies and emerging markets is typically four to six years.<sup>5</sup> In addition (as noted above), they found that the magnitude of the housing cycle is not typically different for advanced and emerging economies.

Reinhart and Rogoff also suggested that banking-related recessions last approximately three years, with GDP dropping in all three. According to these authors, real growth declines around one percent in the first year, a little more than one percent in the second year, and then roughly half a percent in the third year. Growth rates do not return to pre-crisis levels until the fourth year.<sup>6</sup>

Regretfully, the Reinhart and Rogoff results will more likely apply here than the forecasts advanced by optimists. Specifically, the current recession will probably extend through 2009 and perhaps even to the middle of 2010. I base this pessimistic conclusion on the following considerations. First, the banking crisis is still in full force. Second the fiscal stimulus programs proposed by the United States and other countries are not large enough. Third, financial markets remain in a state of disrepair, if not collapse.

Start with the fact that the banking crisis has not come to an end. In fact, it may not have even reached the end of the beginning. For example, one of the largest financial organizations in the United States, Citigroup, has been teetering on the brink of failure. Some observers suggest the bank might have to be nationalized. According to Reinhart and Rogoff, bank failures persist

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<sup>4</sup> Reinhart and Rogoff, p. 3.

<sup>5</sup> Reinhart and Rogoff, p. 30.

<sup>6</sup> Reinhart and Rogoff, p. 38.

for more than one year. Thus, the banking sector's continuing problems will block lending, limit investment, and extend the current slowdown.

The recession will also be prolonged by the inadequate size of the economic relief packages proposed by the United States and other nations. The depth and breadth of the downturn will probably be much greater than many policymakers believe or are willing to admit. Some have realized the true magnitude of the troubles, however. In a paper published in late December 2008, for example, IMF economists made this dire pronouncement:

The current crisis, which started in the housing and financial sectors, has now led to a strong fall in aggregate demand. There are indications that this fall could be larger than in any period since the Great Depression.<sup>7</sup>

The IMF paper was labeled as a "staff position note." However, one of the authors is Olivier Blanchard, the IMF's chief economist, so one must assume the analysis has the organization's blessing.

The IMF authors noted that the crisis calls for significant measures to increase demand and restore confidence. They specified that the fiscal packages should be "timely, large, lasting, diversified, contingent, collective, and sustainable." They called for "contingent" measures because they are worried about the risk of another Great Depression. The authors called for significant fiscal measures because "the current crisis will last for several more quarters."<sup>8</sup> While they published no numbers in the report, the IMF economists later urged large expenditures in a press conference held at the release of their position note.

The program proposed by the Obama administration will not be adequate. As noted above, U.S. debt will rise at least \$5 trillion and more likely \$9 trillion in the current crisis. The debt increase will occur as governments spend more and tax revenues fall. The program under discussion in Congress falls well short of this magnitude. In a recent report, Macroeconomic Advisers noted that the stimulus will only provide something like \$775 billion for 2009 and 2010.<sup>9</sup> To make matters worse, the governors of the 50 U.S. states are acting, to use Paul Krugman's phrase, like "Herbert Hoovers." In other words, they are cutting expenditures as times worsen even though they recognize the action is wrong. (Most state constitutions require balanced budgets.) Under these circumstances, the U.S. stimulus program will leave the nation mired in recession for two years.

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<sup>7</sup> Antonio Spilimbergo, Steve Symansky, Olivier Blanchard, and Carlo Cottarelli, "Fiscal Policy for the Crisis," *IMF Staff Position Note SPN/08/01*, December 29, 2008, p. 2.

<sup>8</sup> "Fiscal Policy for the Crisis," p. 2.

<sup>9</sup> Macroeconomic Advisers, "Fiscal Stimulus to the Rescue," *Macro Focus*, January 15, 2009.

Finally, the collapse of the financial system will also delay recovery, in part because financial institutions cannot resell loans. Another factor is that much of the credit supplied over the last decade came from outside the banking system. Hedge funds, pension funds, and other new intermediaries offered credit on favorable terms. At the same time, banks often made syndicated loans. As a result, three out of four dollars lent by banks were quickly converted to securities and taken off their books.

Today these new forms of credit have vanished. Banks are once again the source of credit for most borrowers. While central banks have stepped in to buy low-quality loans from banks and backstop the financial system, most of the innovations popular a year or two ago have vanished. Thus, credit is being squeezed.

### **The Return of Regulation**

Writing in *The New York Times*, conservative columnist William Kristol remarked on the importance of Barack Obama's election when he made this observation: "All good things must come to an end. January 20, 2009 marked the end of a conservative era."<sup>10</sup> A key component of the "conservative era" was the removal of economic regulation. With Ronald Reagan's inauguration, the United States and much of the world embarked on a period of economic liberation that may be unparalleled in history. The United Kingdom, led by Margaret Thatcher, matched deregulatory efforts in the U.S.

In the United States, a cadre of economists systematically attacked regulations across the board. They removed rules governing the petroleum sector eight days after Reagan's swearing in. They terminated the program to build a synthetic fuels corporation funded with taxpayer dollars. They also began deregulating financial markets. In the UK, Mrs. Thatcher oversaw the privatization of government subsidized ("council") housing, the removal of various regulations across much of the economy, and the end of government financial support for a number of industries.

Both governments aggressively sought to eliminate regulations while simultaneously reducing the leverage of labor unions. Mrs. Thatcher notoriously put the UK through prolonged hardship to break the power of British coal miners. President Reagan fired most of the air controllers in the United States when they went on strike. Numerous books have celebrated the success of Reagan and Thatcher. *The Commanding Heights* by Stanislaw and Yergin, for example, details the economic victories of their deregulatory efforts.

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<sup>10</sup> William Kristol, "Will Obama Save Liberalism," *The New York Times*, January 26, 2009, p. A21.

For the last 28 years, the United States, and to a lesser extent Great Britain, have continued on the deregulatory path pioneered by Reagan and Thatcher. In the UK, Prime Ministers John Major and Tony Blair promoted unregulated markets, as did the administrations of George H.W. Bush, Bill Clinton, and George W. Bush. The latter Bush has been particularly forceful in his efforts to lift market controls.

The last 28 years will likely become known as the golden era of deregulation. The period officially ended on January 20, 2009, with Obama's inauguration, but the end really began on March 17, 2008, when the U.S. government bailed out Bear Stearns. As president, Barack Obama will undoubtedly direct much greater government involvement in the financial and manufacturing sectors. Salaries and bonuses paid to financial officials will likely be regulated by Washington. Federal overseers will watch over and perhaps dictate production plans to U.S. automakers. The Federal Reserve Board or the Secretary of Housing and Urban Development will probably prescribe the types and terms of mortgages offered to new home buyers. The days of buccaneer capitalism will be over.

The return of regulation could drastically alter the growth pattern and rate of energy use in the United States, other industrial countries, and quite possibly developing nations such as China. Going forward, growth rates will be lower than currently projected.

The seminal change in the attitude toward regulation can perhaps best be understood in the context of U.S. automobile fuel economy standards. Regulations were first imposed by the Energy Policy and Conservation Act (EPCA) of 1975. This law set requirements for fuel economy by year for every manufacturer beginning in 1978.

These regulations could have been tightened during the 1980s and 1990s. Gasoline use would have been two million barrels per day lower in 2008 (2.3 percent for global consumption) had the government followed through on the 1976 initiative. However, the Reagan administration, as well as those that followed, refused to act.

The situation changed with Obama's inauguration. New fuel economy regulations will be imposed. Other measures will be taken to cut energy demand and additional regulations will probably be imposed on the financial sector and other parts of the economy. This return to the regulatory approach will cut oil use as much as three million barrels per day by 2012.

Increased economic regulation will also likely slow the rate of economic growth from 2010 on. The impact could be global, given the international focus on the financial sector. The

slower economic growth could cut global oil use by as much as two million barrels per day by 2012.

### **The Collapse of the U.S. Auto Sector**

The likely failure of U.S. automakers General Motors, Chrysler, and possibly Ford will further depress growth in global oil consumption. The auto industry's problems have been thoroughly chronicled in the financial press. Here I note simply that U.S. auto sales have dropped to levels not seen since 1980. Furthermore, consumers have responded to the auto industry's distress by boycotting products offered by U.S. manufacturers.

It now appears that U.S. auto makers will sell very few vehicles in 2009, assuming they manage to survive financially. It also appears that future financial aid offered to the firms by Congress will require sharp increases in fuel economy above standards specified in existing legislation. U.S. fuel consumption would drop if the industry meets these standards.

However, it is more likely that two U.S. auto companies will fold, given the likely length and depth of the U.S. recession. The closure of GM and Chrysler will noticeably change the future composition of the U.S. fleet, leading to much lower fuel consumption levels.

### **The Election of Barack Obama**

The inauguration of President Barack Obama is the fourth contributor to the lower oil price environment. President Obama's campaign platform called for aggressive pursuit of measures to reduce U.S. greenhouse gas emissions and dependence on imported oil. Within a week of his inauguration, President Obama reversed various Bush administration decisions that had increased petroleum consumption.

President Obama took the first step on January 26 when he ordered the Environmental Protection Agency to review California's application for permission to impose its own fuel economy standards on vehicles marketed in the state. At the same time, President Obama ordered the Department of Transportation to finish new regulations lifting corporate average fuel economy standards. The two steps will likely lower U.S. gasoline and diesel consumption significantly by 2012.

The Obama administration promises to offer other programs to reduce energy and oil use through the spring of 2009. At this time, passage of these new regulations seems very likely.

President Obama has also indicated that the United States will work with other countries to establish new limits for emissions of global warming gasses. Rules and regulations will be created to meet the standards established at the upcoming meeting in Copenhagen.

### **Impact on Global Energy Consumption**

The most widely circulated longer-term forecasts of global energy and oil demand through 2012 or 2015 anticipate modest but steady growth. Consumption is projected to rise by around one percent per year in the recently released IEA long-term forecast and by half that in the advance issue of the U.S. EIA's *Annual Energy Review*. These projections will be wrong, as are all forecasts. However, the magnitude of the errors in forecasts issued at the end of 2008 and beginning of 2009 will be greater than normal.

Looking forward to 2010 and 2011, one must expect declines in oil use rather than the increases predicted by the IEA and DOE, given the grim outlook for the economy and the prospects for heightened regulation. Historical relationships suggest that declines in global use between two and four percent should be expected in 2009. Use should drop another two percent in 2010 from 2009 and one percent in 2011 from 2010. This suggests that by 2012 global oil consumption will likely be around 80 million barrels per day, not the 87 million barrels per day forecast by DOE.

The decline in global energy requirements will challenge the ability of the world's oil-exporting countries to manage the market. Surplus crude productive capacity will increase over the next four years. OPEC will likely have difficulty controlling the market from time to time.

### **III. From Dawn to Twilight**

Matt Simmons titled his book *Twilight in the Desert*. As noted above, he argued that Saudi Arabia lacked the capacity to meet the consumption increase projected by many experts. The consequence, in his view, would be very high prices, possibly in perpetuity.

In this context, Simmons probably chose the wrong metaphor because dawn usually follows dusk, just as day follows night. Here I have argued that world consumers will enjoy a new period of low oil prices thanks to the global recession, new regulatory programs, the failure of the U.S. auto sector, and the programs advanced by President Obama.

This period of low prices will not last indefinitely, however. Just as day follows night, night will follow the day. Oil prices will rise again. At this time, the next major hike will likely

accompany the introduction of new regulations limiting sulfur content in fuels used by ships, otherwise known as bunker fuels. Today, these fuels represent the dregs of refining. They are heavy and contain large amounts of sulfur. One source puts the sulfur content of such fuel sold at the U.S. Gulf at 27,000 parts per million (ppm). ULSD, in contrast, contains 10 ppm.

The International Maritime Organization (IMO), a nongovernmental group located in Geneva that governs global shipping operations, has agreed to reduce the cap on sulfur oxide emissions from ships from the current level of 4.5 percent to 3.5 percent in 2012 and then to 0.5 percent by 2020 if the standard is feasible. Separately, a ceiling on fuel sulfur content is set at 1.5 percent and would be lowered to 0.1 percent in 2015. Senator Barbara Boxer of California has proposed moving the 0.1 percent rule forward for the United States to the end of 2010.

These rules could impose significant constraints on the world's refining industry. Many refiners might have to shut down if the rules are enforced widely and carelessly because they lack capacity to remove sulfur from bunker fuels. In addition, one IEA report warned that the world's refining construction industry cannot build the necessary desulfurization capacity in the time horizon specified in the rules, assuming world refiners had the money to pay for the upgrades. There is, then, a risk that the rules will force a substantial reduction in the volume of crude refined. Such an outcome would, of course, be accompanied by an offsetting price increase of enormous magnitude.

Ordinarily one would dismiss such warnings as "scare tactics" advanced by interested parties. This, however, is not the case. I have no stake in the matter at this point. Furthermore, as noted above, from 2006 to 2009 the absence of coordination between the world's environmental regulators, energy departments, and the refining industry regarding the introduction of ULSD doubled oil prices from \$70 to \$140 per barrel. I am confident that environmental regulators and energy policy officials can stage a repeat performance, thereby again taking the world from dawn to twilight.