

Oil: Demand, Supply and Trends in the United States

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The views expressed below after the useful historical survey were written in a 'term paper' at the Goldman School, and do not necessarily reflect CITRIS Center policy view

The Industry:

In 1950, the United States was the only country with a well developed oil industry. Today, the energy sector as a whole is the largest industry in the world and accounts for over \$3 trillion dollars in annual sales. The second largest global industry, food, accounts for \$1.7 trillion.¹ Between 1950 and 1973 the world oil industry grew 9-fold – a rate of increase of 10% per year, sustained over a period of 20 years. During that time period, the world produced over 2.5 billion new motor vehicles, half of which in the United States.²

The world demand for oil has multiplied from 11 million barrels per day (mbd) in 1950, to 57 mbd in 1970, to almost 80 mbd today. The United States consumes 20.7 mbd, which is the most of any nation and equals the consumption of the next 5 largest national consumers (China, Japan, Germany, Russia and India). World demand has recently grown as the economies of China (6.5 mbd) and India (2.3 mbd) have developed, but the United States remains the largest consumer.

The five largest producers of oil are Saudi Arabia (10.37 mbd), Russia (9.27), United States (8.69), Iran (4.09) and Mexico (3.86). Proven oil reserves are concentrated in the Middle East (60%).³ Conservative estimates predict the world oil supply will last for the next 50 years, given the current trends in demand. Rising prices provide incentives to extract oil from more expensive sources.⁴ Cheap, easily accessible oil is running out, however, and technology and the world economy must prepare for this change.

American demand for oil is comprised of four major sectors: transportation, industrial, electricity generation and residential/commercial. Transportation accounts for almost 70% of all US oil consumption, of which 2/3 is motor gasoline.⁵ American consumers are accustomed to cheap and plentiful gasoline and have structured cities and lifestyles around this fact.

¹ Kammen, D., "An Energy Policy for the 21st Century," *Policy Matters* (Fall 2005).

² Parra, F., "Oil Politics: A Modern History of Petroleum," (I.B. Taurus 2004).

³ *Financial Times* (www.ft.com). See attached charts.

<https://registration.ft.com/registration/barrier?referer=http://news.ft.com/world/oil&location=http%3A//news.ft.com/cms/s/67a73ea0-2f8e-11da-8b51-00000e2511c8.html>

⁴ *The Economist*, "Steady as she goes," (4/20/2006).

⁵ Energy Information Administration (www.eia.doe.gov) See attach graph.

A Brief History of the Oil Industry:

The history of oil is understood through rising demand, fears of supply shortage, international security concerns and crises, and mounting profits.

In 1948, the United States became a net importer of oil. Seven major companies, “Big Oil,” spearheaded the world industry. Of these companies five were American -- Chevron, Exxon, Gulf, Mobil and Texaco – one was British (British Petroleum), one Dutch (Shell) and one French (Compagnie Francaise des Petroles, CFP). The developing countries that owned the vast supply of discovered oil reserves were scattered across the earth: Indonesia, Iran, Iraq, Kuwait, Saudi Arabia and Venezuela.⁶ The unparalleled Middle East oil reserves were discovered during this period as well (of the dozen largest oil fields in the world 10 are in the Middle East).⁷ The companies proceeded to construct legal and business systems for extracting the oil and controlling supply.

At the industry’s inception, American policy makers expressed concern over both corporate trust violations and security concerns. Dependency on foreign oil was seen as a security risk even when it only represented 10% of supply in 1948, as opposed to today when it accounts for over 50% of consumption. Security concerns trumped anti-trust litigation, however, and the 5 American companies successfully created an oligopoly in conjunction with the 3 foreign firms. Smaller companies entered the market during the course of history, but never rivaled the scope of the original companies.

In response to the growing industry and rising profits, the producing countries began to push back against the oil industry and formed the Organization of Petroleum Exporting Countries (OPEC). OPEC was created in 1960 by Iran, Iraq, Kuwait, Saudi Arabia and Venezuela. Eight other countries later joined OPEC: Qatar (1961); Indonesia (1962); Libya (1962); United Arab Emirates (1967); Algeria (1969); Nigeria (1971); Ecuador (1973) and Gabon (1975). OPEC was slow to develop and had no real bargaining power in the 1960s.

In the 1970s, a rising fear of supply shortages began to grip the oil companies. America imported one-third of its consumption, while world demand was increasing at a rate of 2-3 mbd per year, and most of this increase would have to come from Middle East oil.⁸ OPEC began to demand higher taxes and an increased share of oil profits. The oil companies could have fought viciously against these demands, but were constrained by a number of factors. According to oil historian F. Parra, oil companies lacked both political and public support to fight against the rising demands of OPEC. Anxiety about supply shortages also paralyzed the producers. Finally, the industry could pass increased costs onto the consumer and increased prices would permit the development of oil fields outside of the Middle East, such as the North Sea and Alaska.⁹

⁶ Parra, F., “Oil Politics: A Modern History of Petroleum,” (I.B. Taurus 2004).

⁷ Ibid.

⁸ Ibid.

⁹ Ibid.

1973 marked the first oil crisis: the Arab oil embargo. After the Six Day War of 1967 between Israel and surrounding Arab nations, Arab countries of OPEC became politically organized to counteract the policies of the West and Israel. US policy makers recognized the threat of OPEC and the insecurity of the oil industry, namely: America's dependence on a few foreign countries; the potential to use oil as a political weapon; and the threat of rising prices. But besides a declaration of a need for alternative energy sources, US policy under the Nixon administration did not prepare for the upcoming crisis.¹⁰

In 1973, the Yom Kippur War, or the Arab-Israeli Conflict, sparked a series of political and economic crises. In response to Western support of Israel, the Arab countries of OPEC placed an embargo on oil supplies to the United States on October 16th, 1973. Arab countries protested the support of Israel, but also their marginalization by the global economy. The boycott caused an unprecedented spike in oil prices that initiated a global recession and inflation. The price of oil skyrocketed from under \$10 to over \$40 per barrel, in 2004 dollars. In March of 1974, the oil embargo to the US was lifted due to progress with Arab-Israeli negotiations. International politics and insecurity would continue to have an impact on the supply and price of oil.

The 1973 embargo sparked a number of policy changes in the US related to consumption and conservation. Price controls and rationing were instituted nationally along with a reduced speed limit to save gas and daylight savings time. Nixon proposed *Project Independence*, which would enable the country to be energy self-sufficient by 1980, but this proposal was regarded as impossible.¹¹ President Ford created the *Energy Policy and Conservation Act*, which was widely regarded as insufficient, but did create the strategic petroleum reserve (SPR) and mandated the doubling of fuel efficiency in automobiles from 13 to 27.5 miles per gallon through Corporate Average Fuel Economy (CAFE) standards.¹² Finally, the search for alternative sources of energy ensued, further promoting the nuclear, coal, natural gas, wind and solar industries. The policy responses in the 1970s mirror the policy responses of today, namely increased diversification of energy resources and increased efficiency.

The second oil crisis to grip the world was in 1979. The Iranian Revolution sparked existing fear and anxiety in the oil market, which resulted in the tripling of oil prices in the span of months. Oil prices reached over \$70 per barrel in 2004 dollars.¹³ While there was never a overwhelming oil shortage, Iran represented one of the world's largest oil producing states and memories of 1973 still lingered. American companies made impressive profits due to the spike in prices, while American consumers protested.

President Carter promoted increased conservation and according to some historians poorly dealt with the crisis in his infamous "malaise speech," given on July 15, 1979. Carter's policy was driven by fear of an abrupt end to the oil supply, but this was not

¹⁰ Ibid.

¹¹ Ibid.

¹² Ibid.

¹³ *Financial Times* (ft.com)

supported by public opinions. At the end of the crisis, prices began to drop, inflation was still rising, but the OPEC cartel was loosening its hold on the world market as member states would soon begin to compete with one another. The profits enjoyed by the non-OPEC producers during the crisis proved to be too appealing.

Government inaction and the rise of non-OPEC oil describes the decade of the 1980s. In 1981, non-OPEC oil out-produced OPEC oil for the first time in history. Increased prices relative to the pre-1973 levels – \$20-30 per barrel in 2004 dollars – allowed for the development of the North Sea and Alaskan oil fields.¹⁴ Oil consuming countries decreased their demand for OPEC oil as domestic production increased.¹⁵ As a result, OPEC produced oil declined steadily after 1979 and did not recover until 1985.¹⁶

The Persian Gulf War in 1991 caused fears of another oil crisis, but no such crisis occurred. The war caused no major impact on prices or supply and was not a prolonged conflict. Political change in Russia during this time also led to more investment and development of Caspian and then Russian oil fields.¹⁷ As a result, energy and oil fell off the radar of the United States government. The market appeared to be running smoothly and satisfying the world's energy needs.¹⁸

The new century, 2000, has uprooted the acquiescence of the 1990s. The rising demands of countries such as China and India coupled with increased international insecurity have strained oil supplies and risen prices. China has increased its demand by 4 mbd since 2000, for example.¹⁹ Political instability in Venezuela, Nigeria, Russia and particularly Iraq and Iran have destabilized the oil market. Some analysts conservatively argue that political instability accounts for \$10-15 of the current price of \$70 per barrel.²⁰ Furthermore, output from the North Sea and Alaska has begun to decline.²¹ The rising prices have not spurred an economic recession or inflation, but major users of energy and low-income consumers are negatively affected. Projections for the next year indicate prices are not likely to decline below \$60 per barrel.²²

Current Energy Problem and Possible Policy Responses:

The current energy problem mirrors the history presented above. International instability and rising demand have severely impacted prices, which reached an all-time high of over \$70 per barrel earlier this year. Both domestic and foreign oil producers are relishing in high prices by posting record profits. The growing trade imbalance in favor of oil

¹⁴ Ibid.

¹⁵ Ibid

¹⁶ Ibid.

¹⁷ Butler, N., "The Challenge of Energy Insecurity," speech given at the Aiken Gump Energy Conference, Dubai, (www.bp.com, 3/13/2006).

¹⁸ Ibid.

¹⁹ Ibid.

²⁰ *The Economist*, "Steady as she goes," (4/20/2006).

²¹ Ibid.

²² *Financial Times* (ft.com)

producing nations jeopardizes American long-term economic health.²³ The current level of US national debt – \$8.3 trillion – coupled with the Iraq War places the US in an extremely vulnerable position. Finally, unmentioned as of yet, is the rising threat of global warming and its cost to society.

The US government is scrambling to find a policy response as consumers and voters are growing anxious and angry. Current policy alternatives to the growing energy problem strongly resemble the policy responses of the 1960s and '70s. Increased efficiency, conservation and diversification of supply are all mentioned as possible solutions. Government inaction during previous decades has left current policy makers with few immediate solutions, however. Fuel efficiency standards, for example, have not significantly changed for two decades. The fleet average of 27.5 miles per gallon remains a product of President Ford's legislation in the 1970s.

Current proposals fall into four major categories: increase the oil supply, decrease Middle East oil demand through efficiency and alternatives, audit oil company profits, and subsidize individuals hurt by rising oil prices.²⁴ President Bush and other oil consuming nations have pressured oil producing states such as Saudi Arabia to increase production. But most producers are already at full capacity to take advantage of the high price. The President has also temporarily stopped contributing to the Strategic Petroleum Reserve created by President Ford and proposes halting some environmental regulations that add to the cost of gasoline. Proposals to develop the oil fields of the Artic National Wildlife Refuge (ANWAR) have also resurfaced.

To decrease demand, President Bush proposes increasing efficiency standards for automobiles, although some argue not enough. Improved efficiency is vital to any energy policy. According to analysts, if America was as efficient as the Europeans or Japanese in 1973 during the oil embargo, the United States could have been *exporting* oil.²⁵ The President also suggests increasing tax credits for hybrid and clean diesel vehicles. Increased funding for research into alternative energy supplies, such as ethanol, hydrogen cars, is also recommended by the President.

Moreover, the President proposes for increased efficiency in home appliances, such as refrigerators and air conditioners, as oil is used in 3% of America's electricity production.²⁶ California is the model for success in this type of efficiency improvements. Since 1976, electricity consumption per capita has risen steady in the United States, while remaining flat in California. Efficiency requirements and unique policy alternatives have kept Californian electricity use stable.²⁷

²³ *The Economist*, "Money to Burn," (4/20/2006)

²⁴ "President Bush's Four Part Plan to Confront High Energy Prices," <http://www.whitehouse.gov/news/releases/2006/04/20060425-2.html>

²⁵ Canine, C., "The Golden State's Pioneering Efficiency Plan," *On Earth* magazine (Spring 2006).

²⁶ Kammen, D., "An Energy Policy for the 21st Century," *Policy Matters* (Fall 2005).

²⁷ Canine, C., "The Golden State's Pioneering Efficiency Plan," *On Earth* magazine (Spring 2006).

The President and other law makers have also proposed reviewing the profits of American oil companies and repealing tax breaks for energy companies. A “windfall” profits tax has been proposed by some legislators, but this was tried after the 1979 oil crisis and resulted in less investment by American oil companies for new sources of oil. Some have proposed windfall taxes only on the oil reserves that companies dumped on the market during the price spike.²⁸

Finally, legislators have proposed a credit to consumers who are suffering under the higher prices. Senate Republicans offered a \$100 credit for all consumers to mitigate the negative effects of higher prices. This proposal was immediately rejected by the American public. Criticisms mounted that it was only enough for two tanks of gas. More astute critics argued a gas credit would only increase demand and thus exacerbate the problem. Democrats pushed for a suspension of the federal gas tax, but this ironically did not pass Republican opposition, as it too would increase demand or add to the profits of oil companies. Both proposals are plagued by myopic thinking.

Criticisms of President Bush’s proposals are four fold. First, none of his proposals have a short-term impact. Increased fuel efficiency, hydrogen cars, ethanol fuel, and drilling in ANWAR won’t make an impact for years, if not decades. Secondly, the President’s funding for new technology is misguided.²⁹ The President places the majority of research funding in areas of least probable return, the hydrogen car and advanced nuclear reactors. Furthermore, overall research dollars are still inadequate. In real dollar terms, America spent three times more on energy research in 1978.³⁰

Third, Bush’s proposal of independence from Middle East oil ignores fundamental economic theory, according to *The Economist*.³¹ In the *State of the Union* the President proposed we will replace three-fourths of Middle Eastern oil imports by 2025. Oil is a fungible good, so price shocks in Middle Eastern oil would still impact the price of any imported oil, independent of its origin. Therefore, Bush’s proposal is only valid if America becomes completely energy self-sufficient, which is unlikely.

Finally, none of the President’s proposals aim at making American consumers pay the full cost of oil. Oil causes many negative externalities, such as global warming and international insecurity. The external costs of America’s consumption of oil are not internalized into the cost consumers pay. As a result, consumers over-consume oil and gasoline because they do not face its full cost.

In sum, energy policy requires long-term thinking and planning as well as fresh approaches and ideas. The United States cannot afford to ignore energy policy any longer.

²⁸ *NY Times* Editorial, “Pander at the Pump,” 4/28/06.

²⁹ Swann, C., “Bush’s energy-saving drive starts to misfire,” *The Financial Times* (4/10/2006)

³⁰ *Ibid.*

³¹ *The Economist*, “The pusher-in-chief,” (2/2/2006).

Appendix 1:

Tables:

Source: Financial Times (www.ft.com)

Oil Consumption (Million barrels/day)		Production	
US	20.7	Saudi Arabia	10.37
China	6.5	Russia	9.27
Japan	5.4	US	8.69
Germany	2.8	Iran	4.09
Russia	2.6	Mexico	3.86
India	2.3	China	3.62
Canada	2.3	Norway	3.18
Brazil	2.2	Canada	3.14
S. Korea	2.1	Venezuela	2.86
France	2	UAE	2.76

Country	Percent of Total
Saudi Arabia	22.1
Iran	11.1
Iraq	9.7
Kuwait	8.3
UAE	8.2
Venezuela	6.5
Russia	6.1
Libya	3.3
Kazakhstan	3.3
Nigeria	3
US	2.5

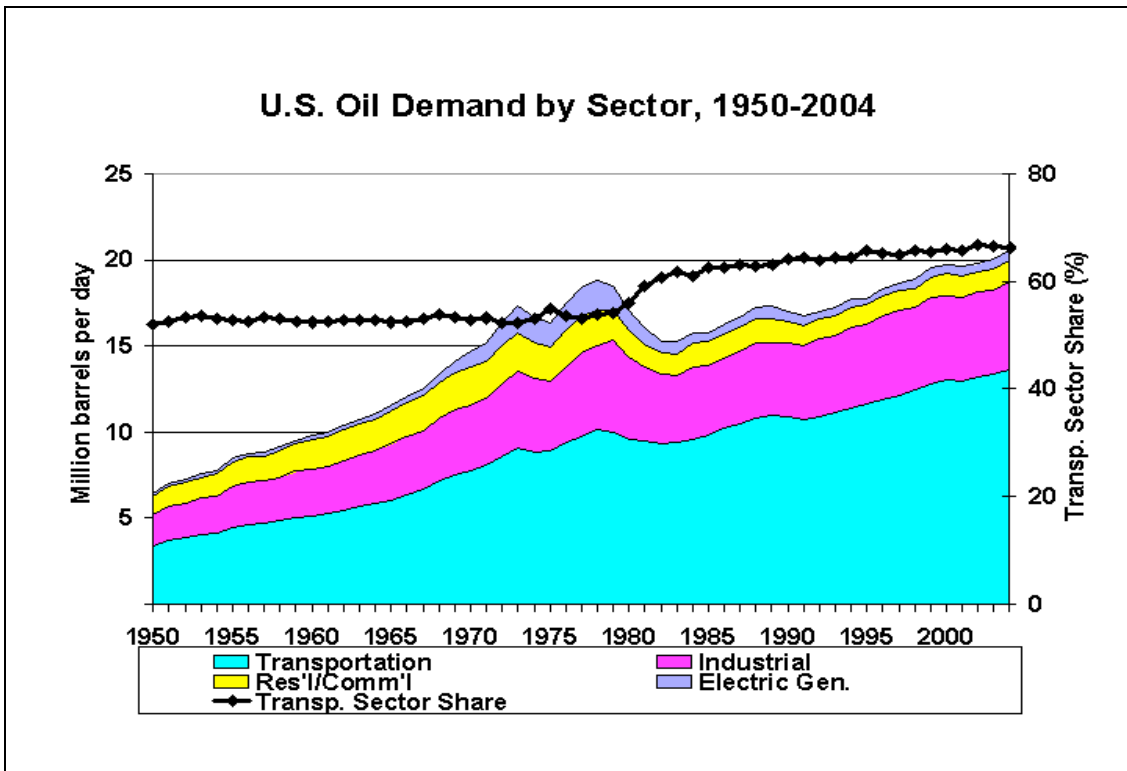
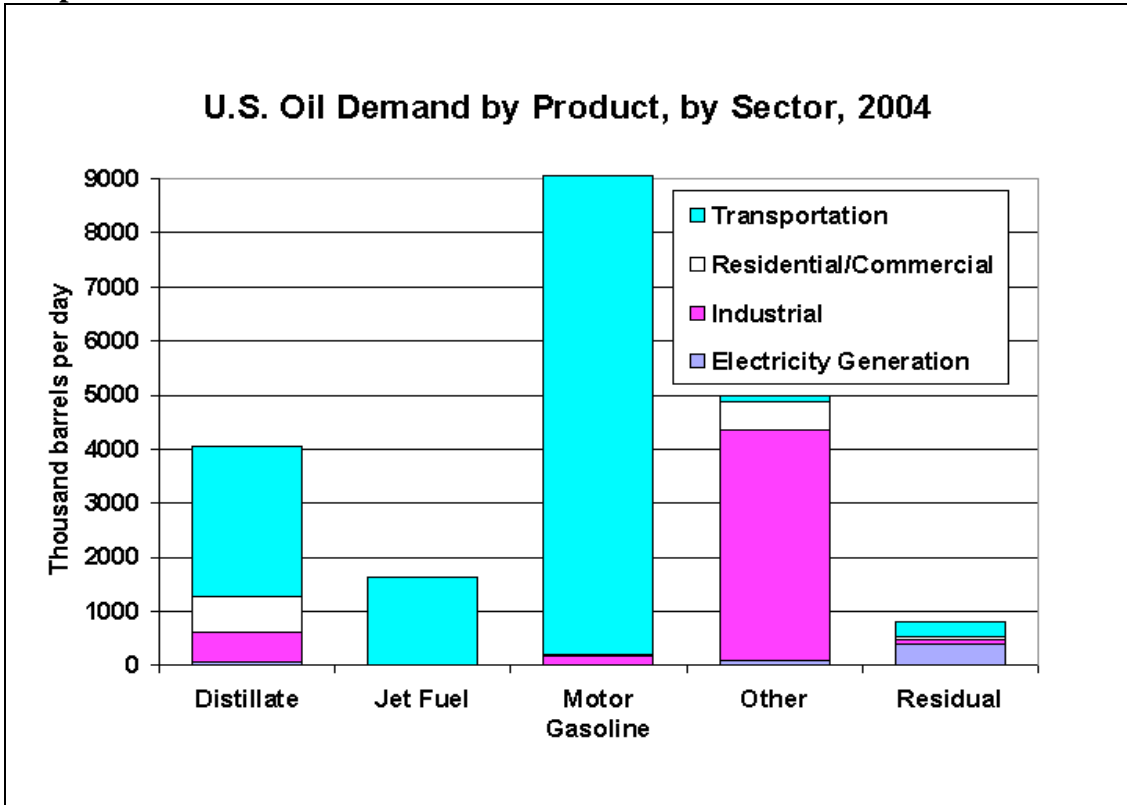
Proved Reserves Oil 2004

Asia/Pacific	41.1
N. America	61
S. & c America	101.2
Africa	112.2
Europe/Eurasia	139.2
Middle East	733.9

(millions barrels)

Source	Percent
OECD	7
Opec	74.9
Non_Opec + OECD	14.9
Soviet Union	10.2

Graphs:



Source: Energy Information Administration (www.eia.doe.gov)

