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The Historical Flow of Black Gold: Two Approaches to Energy Security

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INSTITUTE FOR INTERNATIONAL POLICY STUDIES

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The Historical Flow of Black Gold:

Two approaches to energy security

YUJI NAKAMURA

More regulation, or less, this is the dilemma facing policymakers in the energy industry. Energy is essential for economic growth and national security, which in turn increases demand for energy. Thus, maintaining a reliable affordable source is often a political as well as a purely commercial decision. The attacks of September 11 and the subsequent US campaign against terrorism, the escalation of tensions in the Middle East and South Asia, the uncertainty in the US and Japanese economies which have the potential to reverberate around the world, the commitment to the Kyoto Protocol and the collapse of the energy giant Enron, have all served to highlight energy issues. In Japan, after the first main phase was introduced in 2000, the second main phase of deregulation is expected sometime in liberalizing the energy industry is of special interest. In the following article, IIPS Senior Research Fellow, Yuji Nakamura, traces the post-World War II history of the primary source of fuel for the foreseeable future—petroleum—pegging the major events with international political theory.

The various aspects of energy policy has been the focus of many recent debates: The pros and cons of nuclear power, of maintaining the Japan National Oil Corporation, deregulation of the energy market beginning with electricity, and measures to tackle global warming, have all been subject to the hot gaze of the media.¹

There are usually two directly opposing recommendations to any energy policy: one that advocates greater government participation and the other recommending liberalization.

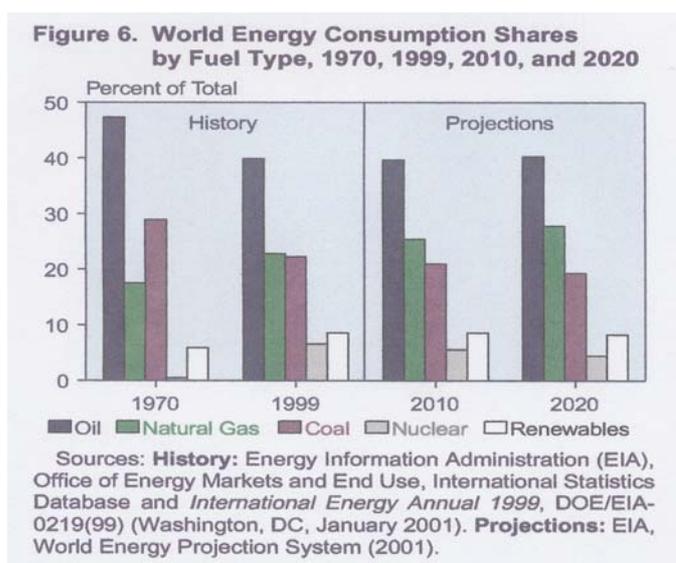
As is well known, Japan is dependent on foreign sources of energy and, at present, 80 percent of its oil is imported from the spectacularly volatile Middle East. Moreover, September 11 revealed the vulnerability of tankers, both oil and liquefied natural gas (LNG), as well as nuclear power plants to potential terrorist attacks. In Japan, greater government participation has been proposed because of the need to protect the weak route of energy supply and the instability of the surrounding geopolitical situation. Specific examples include the Sakhalin energy development in the midst of the northern territories dispute with Russia, the swings in the

energy market of China, (which is poised to become an economic leader), and the territorial disputes in the South China Sea with the associated natural resources.

On the other hand, from the late 1980s, as markets have become more global and economies increasingly interdependent with the end of the cold war, the industrialized world began to focus on the supply and demand of energy. Such attention has meant that there are those who promote greater freedom and relaxing restrictions in the energy markets. This view is held by those who believe that making the energy industry, as an important infrastructure of an economy, more efficient will not only increase the global competitiveness of Japan's industry by reducing the cost of supplying energy, but that supporting market mechanisms and promoting interdependence will strengthen its energy security.²

In this article, how these two differing positions have developed since the end of World War II in the midst of changing international trends are examined, concentrating on the oil markets. Some may query the choice of oil as the subject matter rather than the currently in vogue natural gas.³ Although the importance and potential of natural gas cannot be dismissed, the role of oil as the fuel of choice for transportation and therefore, its importance as the primary energy source, will be maintained for the next 20 years. Figure 1 is a forecast made by the US government's Energy Information Administration (EIA) showing global primary energy demand by fuel type up to the year 2020. Even in 2020, the market share of petroleum is expected to be maintained at around 40 percent despite the replacement of coal by natural gas.

Figure 1—Forecast of global primary energy demand by type



Oil Markets and international relations

Figure 2 shows the changes in regional share that have taken place in the production of oil in the global market from the end of World War II up to the present, including the International Energy Agency (IEA) forecasts up to 2020. In table 3, the major events that have had an impact on oil and oil markets are outlined next to international political events and shifting paradigms. As can be seen in figure 2, the North American share consistently dropped until the end of the cold war in 1991. In contrast, the share held by the organization of petroleum exporting countries (OPEC), the former Soviet Union (FSU), and the North Sea (Europe) had increased. When the major events in oil and the associated shifts in international politics of each decade are viewed side by side, it is quite revealing. This bird's eye view of history shows how energy came to be intertwined with international politics as a "strategic product." Furthermore, the question of how to market oil as a "commodity" due to the transformation in the oil market is answered.

As shown in figure 2, according to the forecasts made by major organizations such as the IEA, the market weight of the Middle East is expected to increase. Adding to the concern is the greater social instability in the Middle East peace process, movements of the conservative wing in Iran, the future of Saddam Hussein in Iraq, and the unemployment levels of young people in Saudi Arabia. Unfortunately, the Middle East is, and will continue to be, mired in despondency with no clear solution in sight. Since the mid-1980s, due to the effects of globalization and greater marketing, oil has been transformed from a "strategic good" into a "commodity." By 2020, however, OPEC, with most of its members concentrated in the Middle East, will have a 54 percent share of the supply (figure 2), and since oil will still account for 40 percent of primary energy (figure 1), it can be seen why countermeasures for the security of the oil supply is a pressing issue.

Figure 2 and table 3 are historical outlines of the major international political events related to the economics of oil from the end of World War II to the present day.

World War II

Due to the impact of World War II, oil has been described as "a product which is closely attached to national strategy, global politics, and power, whose importance has been proven by the use of the forces of nations, and the United States' domination of oil played a central role in the developments and outcome of the war and eventually was the deciding force."⁴ As can be seen from figure 2, in the year 1940, the US accounted for 65 percent of the world's production of oil. Considering that it had virtual control of the world's oil supply, it was not surprising that the US would be victorious in World War II.

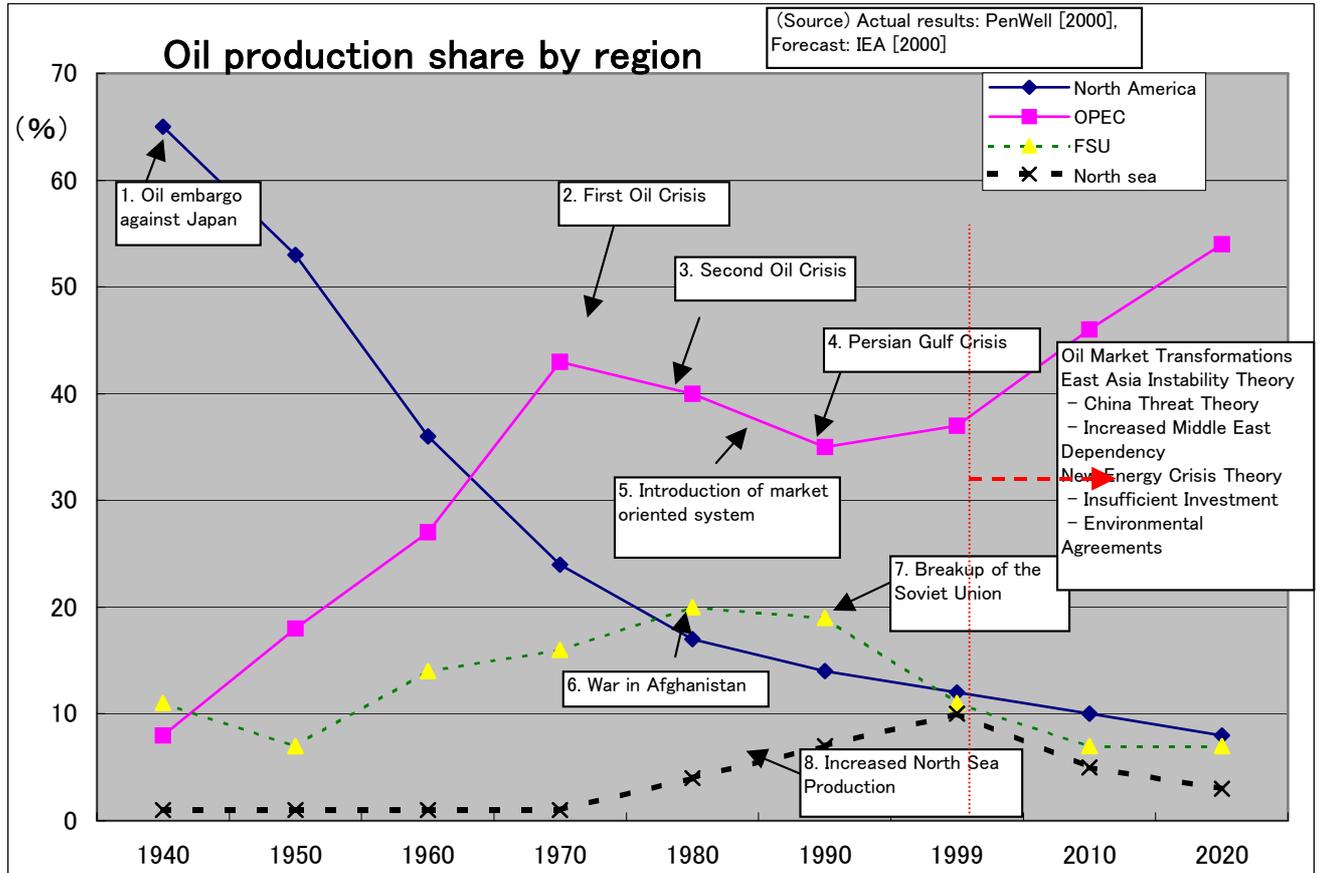


Figure 2 Trends in oil production share by region

Table 3 Challenges to energy security and international political transformation

| Period | Core Events | Mainstream International Political Paradigm | Major Events Affecting Oil | Changes in the Oil Markets |
|-------------|-------------------------------|---|--|--|
| 1950s–1960s | Post-World War II Cold War | Balance of Power Theory 1948 Hans J. Morgenthau <i>Politics among Nations</i> | 1950s Discovery of major Middle East oil fields 1955 USSR becomes major oil producer 1959 US import restrictions 1960 Formation of OPEC | 1950s Age of dominance of the major oil companies 1960s Age of OPEC |

| | | | | |
|-------|---|---|---|--|
| 1970s | <p>Vietnam War (1960–1975) Limitations of military force exposed</p> | <p>Interdependence theory 1977 Robert O. Keohane– Joseph S. Nye Jr. <i>Power and Interdependence</i></p> <p>World System Theory– Subordination Theory</p> | <p>1972 The Club of Rome, The limits to growth, Depletion of resources, environmental and population issues 1973 First Oil Shock, construction of European pipeline network begins</p> | <p>1970s Age of OPEC Domination</p> <p>Resource Nationalism Theory</p> |
| 1980s | <p>Soviet Union invades Afghanistan (1979)</p> <p>Decline of America</p> | <p>Hegemony Stability Theory 1978 Modelsky <i>Long Term Cycles of International Politics and Citizen States</i></p> <p>1981 Robert Gilpin <i>War and Change in World Politics</i></p> <p>Neo-liberalism 1984 Robert O. Keohane, <i>After Hegemony</i></p> <p>Chaos Theory 1986</p> <p>Samuel Huntington, <i>Clash of Civilizations and the Remaking of World Order</i></p> | <p>1980 Second Oil Shock</p> <p>Increased production in North Sea</p> <p>Pipeline Dispute between US and Europe</p> <p>(Window of fragility)</p> | <p>(1983 Establishment of NY oil futures market)</p> <p>(1986 Implementation of market based pricing system)</p> |

| | | | | |
|--|---|---|---|--|
| <p>1990s</p> <p>1989 Persian Gulf War</p> <p>1991 Collapse of Soviet Union</p> | <p>Post-cold war peace between major countries (America recovers)</p> <p>Instability in third world</p> <p>Globalization</p> | <p>Realism: Single Pole Structure and Bandwagon Strategy</p> <p>Liberal: Peace of Democracies</p> <p>1993 Bruce Russett <i>Grasping the Democratic Peace</i></p> <p>Global Governance</p> <p>3-pole Structure Theory</p> <p>1996 Akihiko Tanaka, <i>The New Middle Ages</i></p> | <p>1991 American oil production peaks</p> <p>1993 China becomes net importer</p> <p>Discovery of large oil fields in Caspian Sea and debate about pipeline route</p> <p>Attention on global warming problem</p> <p>1999 ExxonMobil merger</p> <p>2001 Bush's National Energy Policy</p> | <p>1990s Theory of Oil Market Transformation (commoditization, globalization)</p> <p>Theory of East Asia Instability</p> <p>1996 Kent Calder, <i>Pacific Defense: Arms, Energy, and America's Future in Asia</i></p> <p>Theory of New Energy Crisis</p> |
|--|---|---|---|--|

(Source) Created while referring to Yamamoto [2000].

1950s and 1960s

In the era after World War II, from the 1950s to the 1960s, the United States led the global economy in international organizations including the international monetary fund (IMF) and the general agreement on trade and tariffs (GATT), backed up by its overwhelming economic strength in the so-called “Golden Age.”

During and after the war, however, some enormous oil fields had already been discovered in the Middle East and it was already being predicted that “the center of the world’s oil production would shift from the Gulf of Mexico and the Caribbean Sea to the Persian Gulf in the Middle East. This shift would continue until the center completely moved to the Persian Gulf region.”⁵ In actual fact, this prediction came true and, as shown in figure 2, the title of the world’s energy supply was transferred from North America to the Middle East as early as the first half of the 1960s.

In international politics, these were the years of the East-West confrontation and the dominating political theory was one of a balance of power (realism), as espoused by Morgenthau. Despite the East-West standoff, new movements were being formed, and the economic union of Europe was launched, starting with the Rome Treaty in 1958. Although at the time, this was only a Western trend, the theory of union, which provided the ideological background, was the seed for what was to later evolve into the interdependence theory.⁶ The US economy was beginning to slide from its paramount position, whilst other countries saw huge economic growth. In addition, this was the era of development in global trade, which was

undoubtedly propelled by the huge growth in Middle East production of oil.

As one of the two superpowers during the cold war, the Soviet Union, under its planned economy of the 1950s, dramatically increased its production of oil so that within 10 years by 1960 it had doubled its share of world production to 16 percent. That oil was practically given away to the neighboring Council for Mutual Economic Assistance (COMECON) countries, which became satellite nations. As already mentioned, the Middle East overtook North American production in the first half of the 1960s, but even before that in 1959, the US domestic oil industry was being affected by the flow of cheaper imported crude oil from that region. As a result, a temporary import ban was imposed. In the early 1950s, with the nationalization of oil industry in Iran, the major American and European producers, dubbed the Seven Sisters, began to lose their grip on the power and control of oil markets which began to shift to the oil producing countries. This was epitomized by the formation of OPEC in 1960, which symbolized the growing dominance of the new Middle East oil producing countries.

1970s

The 1970s was a time when oil and finance propelled the world even further forward. The United States could see no way out of its involvement in Vietnam which had begun in 1969, and they were defeated in 1975, exposing the limitations of military force at solving international disputes. In 1971, the international financial system was drastically shaken by the US stopping the conversion of gold and dollars (the Nixon shock). The first oil crisis in 1973, which took place during the pessimistic environment after the announcement of growth limitations by the Club of Rome in 1972 (the result of the Resource Depletion Theory), brought stagflation to the economies of the developed countries. This proved that oil could be used as a “non-military weapon,” and definitively meant dominance of the oil markets had moved from the US to OPEC. With economic problems causing friction in international relations and the loss of US clout, the interdependence theory began to make its mark with the publication of *Power and Interdependence* by its two proponents, Robert O. Keohane and Joseph S. Nye Jr. in 1977.²

1980s

In 1979, the USSR's share of oil production exceeded that of North America (figure 2). This was the same time as the USSR's military invasion of Afghanistan, and concern over the repercussions of the US' slip from its supreme position began to take a serious turn. In 1981, the second oil crisis took place and the world economy was once again on the verge of collapse. Aided by increased production from the North Sea oil fields that had been discovered in the 1970s, Europe started to become more regionally self sufficient. Europe also began to actively promote the use of natural gas, and began a full-scale importation of natural gas from western

Siberia, home of the world’s largest natural gas deposits. In contrast, this was the time of the US administration’s debates on the “window of fragility” of the soviet military. Hardly surprisingly, therefore, the Reagan administration firmly opposed western European reliance on energy supplied by the Soviet Union arguing that it lessened Europe’s security. Europe begged to differ and this disagreement led to the “pipeline dispute.” The result was contrary to US aspirations. It was during this period that policy toward the Soviet Union began to diverge with the US pursuing a strategy of containment whilst Europe tried one of engagement. In economics, the 1980s was the era of Reaganomics followed with equal enthusiasm by Japan, the US, and the UK. In foreign policy, conservatism was the order of the day against the background of a renewed cold war. Ironically, realism became popular in international politics as the US lost its ascendancy, and attention was placed on hegemony stability theory presented by Gilpin and Modelsky.

Events in the mid-1980s were to start a new age in the oil markets: In 1983, the oil futures market was established in the New York commodity market. By 1986, a market oriented pricing system had been introduced for oil transactions. Also, as can be seen in table 4, the system of pricing crude oil for long term fixed transactions between governments, (controlled by OPEC), was changed where the price was determined by the movement of spot pricing of crude oil market markers such as WTI and Brent. This was because the dominance of OPEC, which had been an incredibly strong organization in the 1970s, was being slowly eroded away because by the operation of non-OPEC regions like the North Sea. The events of 1985 were to symbolize a breaking point between eras as US oil production, which had been losing market share ever since the end of World War II, peaked and production fell even further. Thus, oil became less of a “strategic good” and more of a “commodity” as part of the progress from increased marketing and globalization.

Table 4 Changes in the system to determine crude oil pricing

| | Price Determinator | Price Determination Method | Transaction Price |
|-------------------------------|--------------------|--|---|
| Fixed Pricing Method (- 1986) | OPEC | Government sales price | Long term fixed pricing |
| Market Based Method (1987-) | Market | Market based method $P_x = P_m \pm a$ $P_x =$ Crude oil export price $P_m =$ Spot price for marker crude oil $a =$ Adjustment factor | Price of long-term contract shifts according to the spot price of marker crude oils, and the spot transaction price is also determined. |

(Source: The Institute of Energy Economics, Japan)

1990s

The end of the Gulf War⁷ which started in 1989 eliminated the nightmare of Saddam Hussein controlling 20 percent of oil produced by OPEC and having an influence on 65 percent of the world's oil reserves held by the organization, 65 percent of the world's known oil reserves. Two years later, the breakup of the USSR saw the end of over 40 years of cold war. In the USSR, various political and economic reforms had taken place since 1985 when Gorbachev took over but the oil industry, which obviously had been run by the state, was strained. Thus, despite the abundant domestic oil reserves, production fell from the 1980s and continued to fall until the end of the twentieth century.⁸ In contrast to the decline in the Soviet Union, China, which had been an oil exporting country, has become a net oil importing country (figure 5) since 1993 because of the surge in demand from the fast economic growth of around 7 percent, and this has created a new player in the international oil market. The oil market is going through another major change. As China seeks an alternative oil supply and challenges the current regime, they could use their navy to defend sea routes. Their insistence on rights in the South China Sea in order to secure natural resources is a source of growing concern as a source of instability. On the other hand, the optimistic view would have it that with increased dependency on a foreign source of energy, the Chinese government would have to be sensitive to the international situation because they would be more dependent on the cooperation of the international community.

The former Soviet Union started a new route centered on Russia and based on the Commonwealth of Independent States (CIS). The discovery of large oil fields in the Caspian Sea⁹ led to several proposals for pipeline routes to transport that oil. Whether to pass through Russia or to secure a transportation route to China started a new round of wrangling among Russia, China, and the United States in a "New Great Game." As can be seen from figure 6, there are four possible options for a transportation route from the Caspian Sea oil fields:

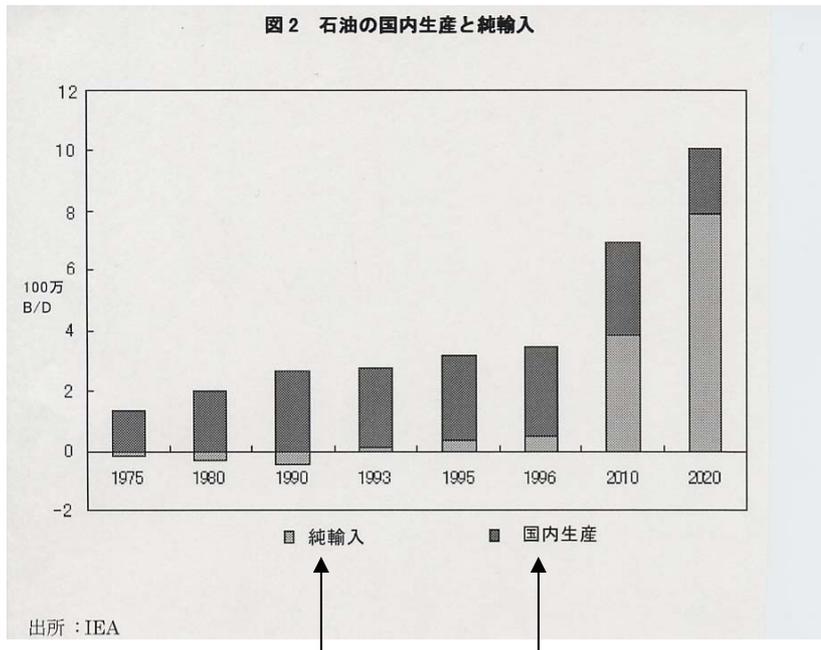
- (1) Northern route: Use the existing pipeline web within Russia.
- (2) Western route: Construct a pipeline to the Ceyhan shipping port on the Mediterranean Sea in Turkey.
- (3) Southern route: Build a pipeline through Iran to the Persian Gulf, or build a pipeline through Afghanistan and Pakistan to the Indian Ocean in order to avoid the bottleneck at the Straits of Hormuz.
- (4) Eastern route: Build a pipeline to export to China.

The cost of building a new pipeline is close to \$3 billion regardless of the option selected. The issue of feasibility of the project meant that securing funding was difficult. Using Russia's

existing pipeline would be the most economical, but the nations from the Former Soviet Union who border the Caspian Sea disapprove and the US is also against the scheme. Therefore, although oil appears to have become a commodity from a strategic product, the wrangling between the major nations over the transportation route from the Caspian Sea shows that oil still retains many characteristics of a “strategic product.”

Figure 5 Forecast of China’s Oil Purchases
—Domestic Production and Net Import of Oil—

unit: 1 million B/D

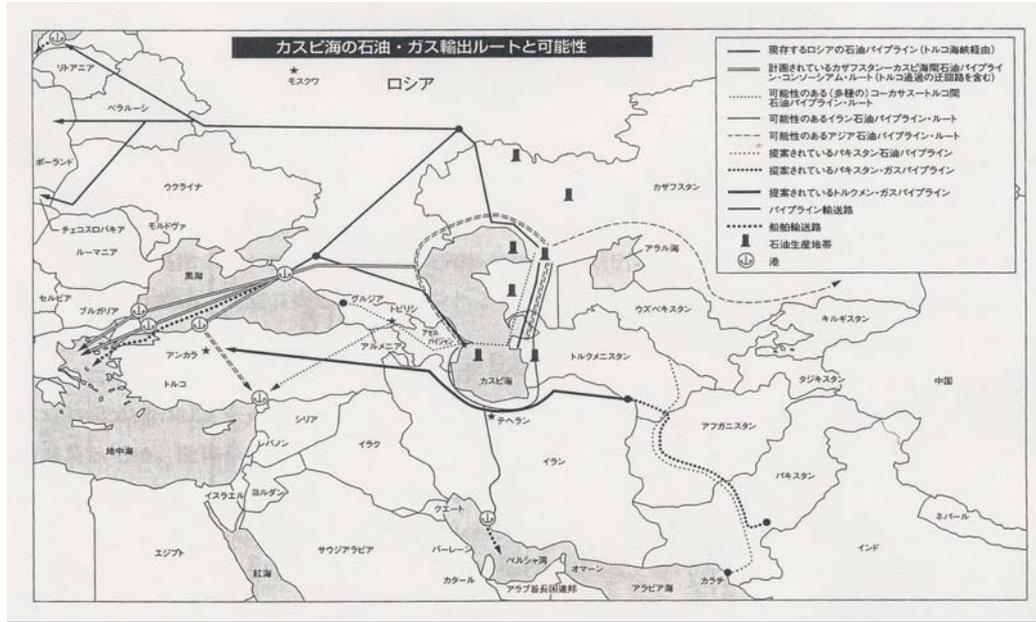


Net import

Domestic Production

(Source: IEA)

Figure 6—Caspian Sea oil transportation routes



Source: Additions made to Tadashi Miyata [1999]

Twenty-first century

In the immediate aftermath of September 11, in the greatest shock yet of the twenty-first century, there was mild anticipation that the US would take the opportunity to reverse her unilateralist policies. At this point in time, this has not been translated into reality by the Bush administration who have taken a cavalier attitude on international cooperation. Vice-President Dick Cheney announced a new energy policy on 16 May 2001, but the strategy was not to promote a reevaluation of the lifestyle of the world's largest consumer of energy. Rather, the emphasis was on how to secure a supply of energy for the US.¹⁰ The development of the Alaska National Wildlife Refuge (ANWR) and nuclear generated electricity put the national interests of America above that of international cooperation. After the terrorist attacks there was no immediate movement to reevaluate this policy, but changes can be expected once debate in Congress starts. For the moment, as of 18 April 2002, Congress shelved the ANWR development project.

The instability in the Middle East was confirmed by the simultaneous terrorist attacks. By 2020 however, according to predictions by major organizations like the International Energy Agency (IEA), the severity of this situation is likely to grow as the dependency of the global economy on Middle East oil will be even greater than at present, as shown in figure 2. According to the IEA forecasts, oil is expected to continue to maintain its lead role as the fuel

for transportation for many years, and if that is true, there are concerns that oil will once again become a pawn of international politics as a “strategic product.”

Approaches to energy security

We have taken a general view of the relationship between energy issues and the changes in international politics that have taken place since the end of World War II. Thus, just as there is a tension between realism and liberalism in international politics, there are basically two major approaches towards energy, which are the market analysis approach and the geopolitical approach.³ Energy is primarily represented by oil, and the approach based on the market is natural. This approach in particular has received a lot of attention because of the recent trend towards globalization. Oil as a tool of strategy is not limited to history as shown by the recent Caspian Sea resource dispute. Therefore, in debates on energy security the geopolitical approach, where the pursuit of national interest is a priority, is becoming more important.

Within each of these approaches are arguments based on region, the field of energy, and the time period. The characteristics of these two approaches have been summarized focusing on Asian energy security and the case of Japan.¹¹

Market analysis approach

1. Economic focus, faith in market mechanisms, suspicions of government intervention in the market

The Japanese economy is more dependent on international oil markets rather than on Middle East oil. Those analysts who are still fixated on Japan's own development of oil have not sufficiently taken into account the globalization and deregulation that has taken place in the oil market since the middle of the 1980s. The so-called Asian Premium, a roughly 10 percent FOB price difference for Middle Eastern crude oil headed for the US and Europe versus that headed for Japan, (figure 7) was part of the reason for the importance Japan placed on developing her own oil sources. However, the real reason that Japan was burdened with this premium was that there was no transparent and restriction-free oil distribution market in Japan. Thus, the problem was irrelevant to the debates on strengthening relationships with Middle Eastern oil producing countries. The Asian premium was not charged because of a lack of negotiating power on the part of Japanese oil companies. Rather, the extra premium was created by the immaturity of the international oil markets. The issue of building a highly transparent free petroleum product market with low barriers to entry needs to be seriously addressed. There is no need for a national corporation like the Japan National Oil Corporation to enter the market and make development investments in the Middle East. Instead, what is necessary is to maintain and stimulate the international oil markets. It is not necessary to develop a major Japanese producer

upstream and it would be better if a transparent and free petroleum market were created. Japan has a globally prominent petroleum products market of about 5 million barrels per day. Clearly, Japan is an important customer not to be ignored by the Middle East countries dependent on oil revenues. It is a sensitive and vulnerable and sensitive relationship. It is highly likely that energy companies with a downstream focus with excellent competitiveness in risk management know-how will develop through the promotion of a free petroleum products market and a transparent gasoline and kerosene market. However, the government should secure strategic reserves in order to minimize disruption in supply, which is completely outside the function of the market. This is because if there is true competition, the oil companies will be forced to become more cost competitive, and will attempt to reduce their inventories.¹²

According to Amy Jaffe of the Baker Institute,¹³ Japan's economy is sensitive to the movements in the energy markets, but the government does not have the best countermeasures.

Due to the transformation of the oil markets since the late 1980s, long disruptions to supply are unlikely, particularly unlikely for one specific OPEC consumer. Figure 8 shows the ranking of the oil crises that have occurred in the Middle East and North Africa between 1950 and 2000.¹⁴ Looking at the case of Iranian nationalization, which took over 44 months from March 1951 to October 1954, the drop in production was around 700,000 barrels per day, but eventually became a cumulative loss of 940 million barrels. Looking at the 50 years since then, supply disruptions have only had a short term effect such as the six months for the first oil crisis (from October 1973 to March 1974), three months for the second oil crisis (from October to December 1980), and three months for the Persian Gulf War (August to October 1990). The drop in daily production was around 3 to 4 million barrels per day, a mere 5 percent of the oil market. This further shows the transformations that have taken place in the oil market. Even if there is a block in the global oil trade, market adjustment mechanisms work to keep the effect minimal. Similarly, in the unlikely event that there is a supply disruption in the oil market, that effect would be felt equally by all affected countries. Rather than developing a domestic oil supply through the Japan National Oil Corporation and making the Japanese public continue to pay a standard premium to secure crude oil, it would be more effective to keep a stock pile of cheap oil, and to release those reserves in times of need. This way, a premium would only have to be paid during times of short term supply, which is likely to continue in the future.

Figure 7 Asian premium for Middle East crude oil

(Source) PIW October 22, 2001

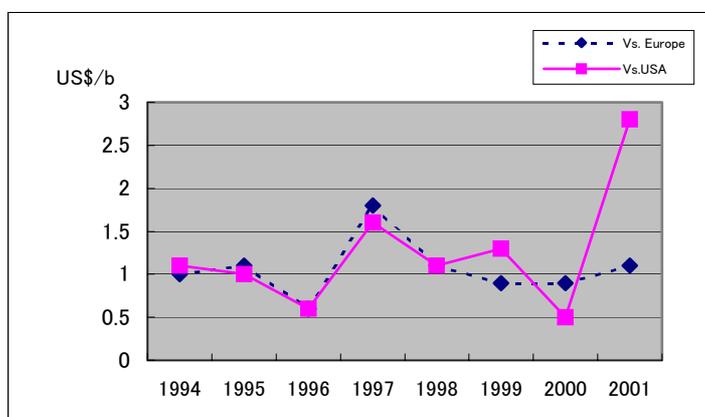


Figure 8

Significant Middle East and North African Oil Crisis, 1950-2000:

| Event | Dates | Gross Loss (mb) |
|--------------------------------------|--------|-----------------|
| Iranian Nationalisation | 1951-4 | 940 |
| Iranian Revolution | 1978-9 | 640 |
| OAPEC Oil Embargo | 1973-4 | 475 |
| Gulf Crisis | 1990-1 | 420 |
| Libyan price dispute, Tapline damage | 1970-1 | 360 |
| Iran-Iraq war outbreak | 1980 | 300 |
| Suez Crisis | 1956-7 | 245 |
| Six Day War | 1967 | 120 |
| Algerian Nationalisation | 1971 | 90 |
| Syrian Transit Dispute | 1966-7 | 65 |

Source: Adapted from US Energy Information Administration figures

2. Globalization and interdependence

The common ground in the arguments of Masa-atsu Koyama, associate director of the Cambridge Energy Research Association (CERA) and Amy Jaffe is that the oil markets have become freer and global since the late 1980s, and the features of oil as a “strategic good” which is non-militaristic in itself but can be used for national interests. It is important to note that oil has become a commodity which can be purchased easily at any time through the international market. Therefore, in our current world of interdependence, pessimistic policies (such as Project Independent) which are aimed at alleviating weaknesses by reducing the dependency on the Middle East by using multiple supply sources should not be stopped. Also, national security

could be further improved by actively opening channels with the Middle East, and by policies which increase the interdependence relationship (Project Interdependent) such as improving the transparency of the Japanese market.

3. Optimism over technical progress

R. Manning insists that “when considering energy security, technology has a tendency to be given too little credit.” From its beginning in the 1970s, the Club of Rome predicted that the world’s oil would be depleted by 1990 but in actual fact, there was still 2.3 trillion barrels that could be mined. This is according to the conventional concept of reserves, but if the Canadian and Venezuelan tar sands are included, there would be an additional 6 to 7 trillion barrels. Therefore, the problem is not a lack of oil reserves. Natural gas is abundant and there should be enough fossil fuel to last this century at least. In the past 25 years, many geologists and environmentalists have highlighted concerns such as depletion of oil, food shortages, and the spread of famine. Although the mass media have reported these claims with zeal, they are clearly not very realistic.

New ground is being constantly broken in energy technology, such as the current application of computerized systems which can discover oil reserves using three or four dimensional earthquake evaluations. Also, it is now possible to drill into extremely deep pockets off-shore to gain access to cheap oil, and drilling dry holes can be eliminated as much as possible. North Sea oil rigs were supposed to peak several years ago but did not, in great part thanks to new technology which extended the life of the rigs. The benefits from improved technology has not been limited to drilling, but also extends to transportation in hybrid vehicles, which will have a large impact on the energy markets. Advances in technology is increasing efficiency. For example, since 1973, the US economy has grown 126 percent, but the use of energy has only increased by a mere 30 percent.¹⁵

Jaffe argues that to counteract the effects of global warming, rather than drafting ineffectual international agreements it is better to rely on technical developments.

4. Separation of energy and national security

Amy Jaffe states that “Energy security must be considered by distinguishing between the two elements of military and economics. In order to protect the Japanese economy, market-focused policies should be chosen, and with regard to the problem of military security (in a narrow sense), the application of the Japan-US alliance should be considered.”¹⁶

5. Deregulation

In analyzing the electricity market, Tatsuo Hatta, professor at the University of Tokyo’s Spatial

Information Science Research Center, argues that deregulation does not only mean greater choice and increased efficiency, but is also necessary for a steady supply and is better for the environment. To criticisms that a free market would be indifferent to supply chains and environmental concerns, he argues that an energy security tax could be levied. A tax in the interests of the public would allow the markets to decide instead of having to rely on government enforced nuclear power.³¹⁷

6. Other followers of the market approach include Michelle Foss, chairperson of the International Energy Society and professor at Houston University, and Tetsuya Iida, senior researcher at the Japan Research Institute.

Geopolitical approach

1. Realism and power politics

According to Jitsurô Terashima,¹⁸ director of the Strategic Research Center at Mitsui and Co., Ltd., marketing on a global scale has transformed oil into a “commodity” from a “strategic product.” The irony is that the result of pursuing a source of cheaper oil has meant greater dependency on Middle Eastern oil which has reached 85 percent, higher than during the oil crises. The situation has worsened, and just when a gap in the supply and demand was expected the Asian crisis erupted, merely postponing the problem for the future. On the other hand, the US has been developing an energy policy with a strategy. The “American Energy Self-sufficiency Plan” is associated with this, and is the hidden agenda of the administration. The crude oil purchasing plan of the US is to maintain domestic production at around 40 percent, to keep sources in the Americas including Canada, Mexico, and middle and central America at 75 percent, and Middle Eastern oil to below 10 percent. The US is maintaining an energy strategy which would minimize the effect of a halt in petroleum from the Middle East. Looking at the data, figure 9 shows the US is basically self-sufficient for its primary energy except for oil. Dependency on imported oil is at 52 percent, but as shown in figure 10, 50 percent of that is imported from other American countries including Canada, Mexico, and Venezuela. Furthermore, as is shown in figure 11, not only does most of the crude oil from the Middle East come from Saudi Arabia, a US ally, but as can be seen in figure 12, the US has even secured a transportation route from the Red Sea through an east-west pipeline for shipping crude oil from Saudi Arabia. Therefore, the US would not be affected even if the flow of crude oil through the Straits of Hormuz came to a complete stop. It is not an exaggeration that while promoting the general theories of economic globalization and international markets, the US maintains a firm hold on a structure of self-sufficiency.

Furthermore, surrounded as it is by Arab countries, Israel's strategy has been to try and obtain 20–30 percent of its consumption from solar energy. In other words, energy is clearly an issue closely linked to national strategy.

Figure 9

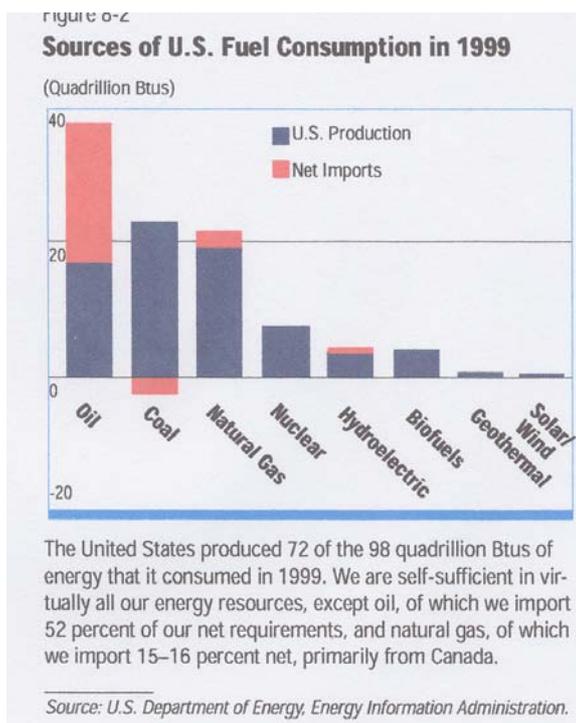


Figure 10

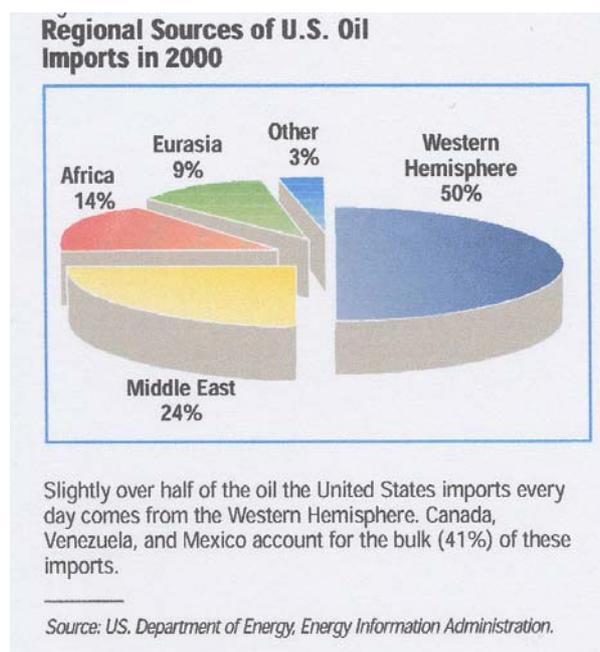


Figure 11

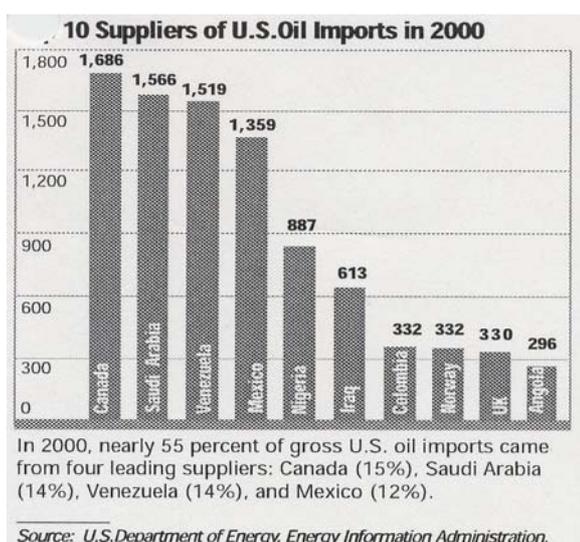


Figure 12



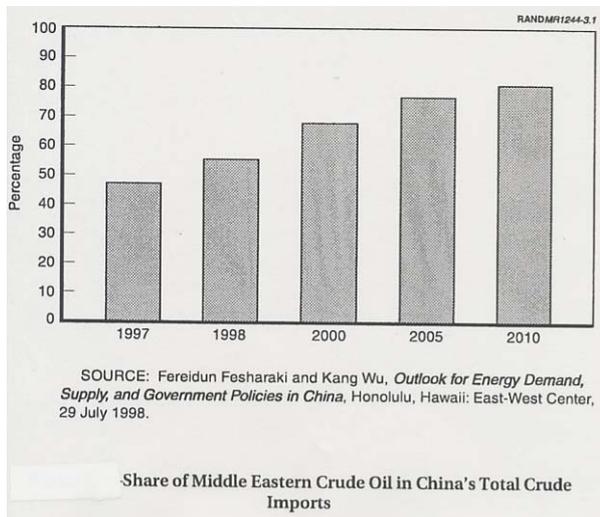
China as a factor of instability

Kent Calder, director of Princeton University's US-Japan Research Center, believes that over the next generation East Asian governments will face increasing uncertainty because of China's increase in demand for energy.¹⁹ Specifically:

- 1) China's dependency on oil from the Middle East is expected to increase in the future as shown in figure 13;
- 2) China will barter weapons for oil and actively contribute nuclear weapons-related technology in order to consolidate relationships;
- 3) China will strengthen her navies in order to defend the sea lanes which are the shipping routes from the Middle East.
- 4) In order to relieve a severe shortage of energy in Southern China, the PRC will begin to strongly insist on ownership rights of the South China Sea natural resources.

In order to avert destabilization in East Asia, Calder suggests that priority on security be increased and that it be broadened to include energy issues. Also, the US, China, and Japan should cooperate to help China develop energy resources. According to the RAND Institute, the Chinese government is depending on past experience when it comes to the energy issue. During the Chinese-Russian honeymoon of the 1950s, China was dependent on the Soviet Union for both supply and technology of oil. In the 1960s however, the Chinese economy suffered a severe oil crisis after the Sino-Russo relationship turned sour. This has reinforced the notion in China that oil is a strategic product. One indication of this is the low cost of oil exports to Japan in the 1970s in an attempt to prevent the possibility of a Siberian oil field development bringing Japanese-Russian relations. In China, oil is still seen as a strategic resource,²⁰ and they do not accept that a free energy market is secure.²¹ The policy of the Chinese government is known as "2 import and 1 export," where imports are made up of oil and foreign capital, and the one export is investment in overseas development ventures. This is an attempt at dramatically reducing their dependency on the sea lanes controlled by the US. The Chinese government is extremely interested in the development of oil fields in Kazakhstan and the construction of a pipeline. This is in order to significantly reduce their exposure to the Middle East oil shipping route, which are essentially controlled by America.²² Furthermore, China does not have capability to refine Middle Eastern crude oil which is high in sulfur, but they have accepted capital investments from Aramco of Saudi Arabia, Kuwait Petroleum Corporation of Kuwait, and National Iranian Oil Company of Iran in order to increase that capability.²³

Figure 13 - Chinese dependency on Middle East Oil

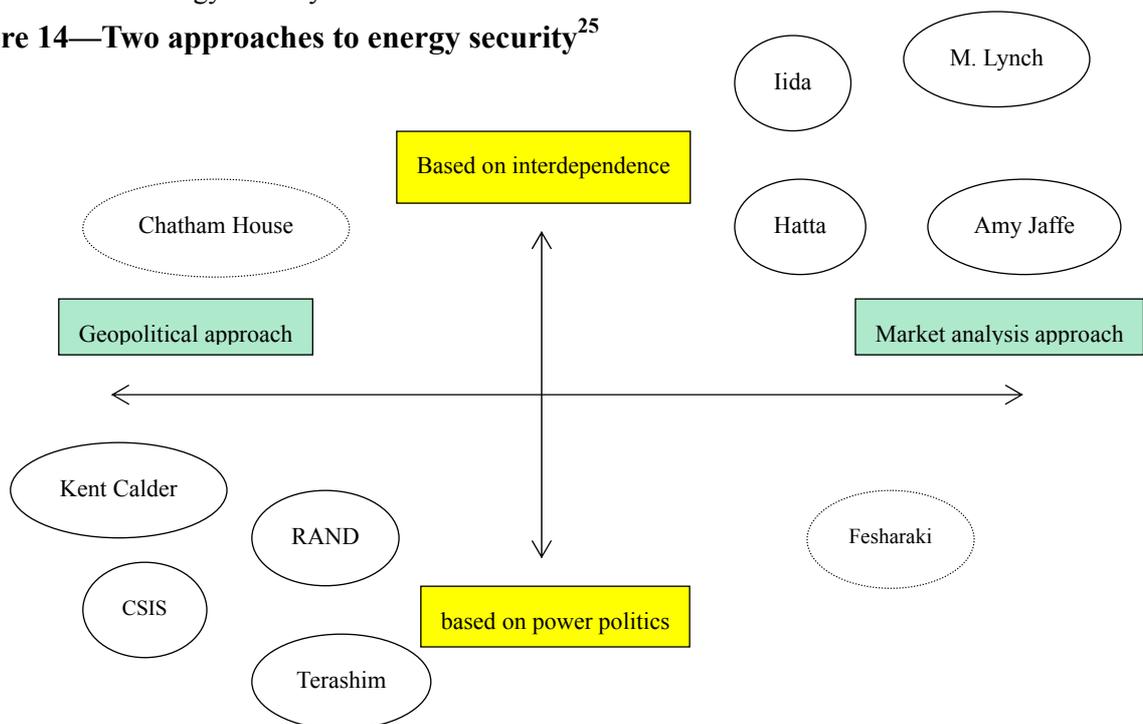


Positive side of nuclear power

Terashima states that Japan should accumulate technologies for a peaceful use of nuclear energy in accordance with its non-nuclear stance and to survive in international society as a lightly armed economic nation. He insists that by doing so, Japan can make major contributions to the international society, which is in its national interest. He suggests that Japan establish and actively propose to the world a Japanese made de facto standard for nuclear power safety.²⁴

As a reference, the major researchers and research institutes have been classified according to their views on energy security.

Figure 14—Two approaches to energy security²⁵



Medium to long term prospects of the oil market

In 1972, the Club of Rome released its report on the limits to growth. Since then, the medium to long term supply of oil has been subject to both optimism and pessimism.²⁶ When considering energy policy, the future of the energy market should be viewed bearing in mind the previously stated world views. From a general viewpoint, the realistic approach tends towards pessimistic forecasts for the future oil supply, while the market analysis approach shows a tendency towards optimism. However, in discussing future oil supply and demand, the IEA forecast will be used without comparing both approaches.

IEA Long term forecasts

Figure 15 and figure 16 show the forecast for supply and demand by geographic region. What is clearly noticeable is the increase in demand by Asia, especially China, and the dramatic increase in supply by the Middle East. The Middle East holds 65 percent of the world's confirmed oil reserves, and OPEC's production share will increase from the 1997 40 percent (29.8 million barrels per day) to 54 percent (61.8 million barrels per day) by 2020. China's demand is expected to double from the 5 percent (4.1 million barrels per day) in 1997 to 10 percent (11.0 million barrels per day) by 2020. Half of the oil used in developed countries is for transportation, and as China moves into an age of motorization, oil will become a critical resource. Various scenarios for future energy supply and demand can be drawn up which are more pessimistic or optimistic than those of the IEA, but even from the optimistic viewpoints, the trends in China on the demand side, and the strength of the Middle East on the supply side will undeniably increase the sensitivity of energy.

Figure 15 - Forecast of World Oil Supply by Geographic Region

(million barrels per day)

| | 1997 | 2010 | 2020 | 1997-2020 |
|-------------------------|-------------|-------------|-------------|------------|
| North America | 10.8 | 9.9 | 9.0 | -0.1% |
| Europe | 6.7 | 5.2 | 3.5 | 2.7 |
| Pacific | 0.7 | 0.6 | 0.5 | -1.3 |
| OECD Total | 18.0 | 15.7 | 13.1 | 1.4 |
| Russia | 6.1 | 7.1 | 7.9 | 1.4 |
| Eastern Europe | 1.3 | 3.2 | 4.4 | 5.3 |
| Total | 7.1 | 10.3 | 12.3 | 2.2 |
| China | 3.2 | 3.0 | 2.6 | -1.0 |
| India | 0.8 | 0.5 | 0.1 | -2.6 |
| Other Asia | 1.1 | 1.6 | 1.4 | 0.1 |
| Brazil | 0.9 | 2.1 | 3.2 | 5.0 |
| Other South America | 5.7 | 6.8 | 6.8 | 0.7 |
| Africa | 2.7 | 1.8 | 1.8 | 2.3 |
| Middle East | 1.9 | 1.8 | 1.6 | 0.8 |
| Non-OPEC Total | 42.0 | 46.9 | 46.1 | 0.4 |
| Middle East OPEC | 19.3 | 30.5 | 46.7 | 4.9 |
| Other OPEC | 10.3 | 13.6 | 15.1 | 1.7 |
| OPEC Total | 29.8 | 44.1 | 61.8 | 3.2 |
| Other | 2.7 | 4.8 | 6.8 | 7.6 |
| World Total | 74.5 | 95.8 | 114.7 | 1.9 |

(Source: IEA 2000)

Figure 16 - Forecast of world oil demand by geographic region

(million barrels per day)

| | 1997 | 2010 | 2020 | 1997-2020 |
|-------------------|------------|------------|-------------|------------|
| North America | 20.2 | 24.0 | 26.1 | 1.1% |
| Europe | 11.1 | 16.0 | 16.8 | 0.7 |
| Pacific | 6.5 | 7.0 | 7.1 | 0.4 |
| OECD Total | 40.9 | 46.9 | 50.0 | 0.9 |
| FSU and E. Europe | 1.7 | 5.8 | 7.4 | 2.0 |
| China | 4.4 | 7.6 | 11.0 | 4.4 |
| South Asia | 2.3 | 4.1 | 6.2 | 4.5 |
| East Asia | 6.1 | 10.1 | 13.6 | 3.3 |
| South America | 6.1 | 8.7 | 10.9 | 2.5 |
| Africa | 2.1 | 3.0 | 3.9 | 2.7 |
| Middle East | 4.1 | 6.7 | 7.0 | 2.4 |
| Non-OECD Total | 30.1 | 45.0 | 60.0 | 3.1 |
| Other | 3.5 | 3.9 | 4.7 | 1.1 |
| World Total | 74.5 | 95.8 | 114.7 | 1.9 |

(Source: IEA 2000)

Major issues

Energy security in China and the Middle East is the subject of various discussions. These include the impact of easing the demand on oil as the global economy slackens because of the slowdown in the US economy, revolutionary technology in renewable energy and fuel cells, increased production in non-OPEC regions (North Sea, Central and South America, Africa, Russia and the countries surrounding the Caspian Sea), and the US' response to international cooperation on global warming.

I traveled to the US in late August 2001 and to Southeast Asia in early October to meet energy experts and discuss in more detail the various aspects of the two approaches. The following is a summary of the issues raised at these meetings.

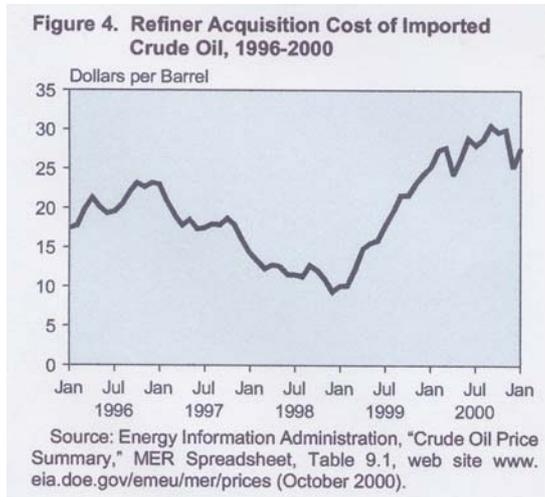
1. Structural problems

In the market approach, the oil market transformation post-1980s has been emphasized but serious problems have yet to be resolved. Transaction volumes in WTI and Brent oil, which are the markers in crude oil, are only around 1 million barrels per day, less than 2 percent of the total world volume traded. Using these local crude oils as Merkmals, or the indicator of global crude oil transactions, is the cause of price volatility. As is shown in figure 17, in the five years from 1996 through 2000, the actual price of crude oil varied widely across a range of \$10 to \$30 per barrel. The economic effect of a \$10 price fluctuation per barrel cannot be ignored. In the US, the effect of the drop in price from \$30 per barrel at the beginning of 2001 to \$18 per barrel by the end of the year was similar to a tax reduction of approximately fifteen billion dollars.²⁷ In Japan, a \$10 price increase is estimated to be equivalent to an outflow of national wealth of approximately \$5000 per day or \$18 billion per year.²⁸

The issue of incomplete information in the oil markets has also not been resolved. Inventory statistics for oil are only monitored in OECD countries, and no one has a firm grasp of the supply/demand fundamentals.

In contrast to above argument, those with faith in the markets and the reliability of the crude oil markers, insist that WTI and Brent should remain the benchmark as they are crude oils of average quality with a global distribution. Quality (heavy and/or sour) rather than market share is a more representative indicator of the market.²⁹

Figure 17—Volatility of the price of crude oil



2. Probability of a new oil crisis

The revival of the US economy was not firmly settled by the simultaneous terrorist attacks of September 11, and this has resulted in a reduction in demand for oil. However, because of favorable economic conditions in the US and the quicker than expected recovery of the Asian crisis, the world's excess production capacity dropped to around 2 million barrels per day from the highs of around 10 million barrels per day in the 1980s. From experience, when excess production capacity drops below 5 percent, the market is strained. This time however, despite the fact that excess production capacity has dropped to around 3 percent, there is still no sign of increasing capacity. Some opine that this is actually the start of a new energy crisis. In other words, there is concern of "unintentional supply capacity shortfalls." Investments in the oil fields around the Caspian Sea are not connected to increased production by non-OPEC regions. Economic sanctions against Iran, Iraq, and Libya are still hindering development investment. The major OPEC countries are reducing investments in energy in order to deal with domestic social issues caused by the explosion in population and youth unemployment. Investment of capital by the major oil companies is pointed not towards oil development, but rather towards mergers and acquisitions. The global warming issue and environmental protection pressures are also restricting resource development.

In May 2001, US President George Bush announced the national energy policy, which was an attempt to resolve these structural risks. At the present time, however, there is no guarantee that when the economy recovers there will be sufficient supply. In the short term, there is speculation that Saudi Arabia has secured an excess supply of approximately 2 million barrels

per day. The long-term supply and demand mechanisms of the oil markets are in question.

3. US energy strategy³⁰

In order to evaluate Terashima's claim that the "North American Energy Network Initiative" actually existed as a continuation of a "hidden agenda" from past administrations, I queried most of the major US researchers on this point. They were unanimous in their response that rather than a hidden agenda, a consistent unified energy strategy did not even exist in America. Bush's new energy policy was supposed to avert a potential crisis from a short fall in supply. Undoubtedly, it will have to go through many changes in Congress because of opposition from the Democrats. Since a national energy policy is subject to the democratic process, policy consistency is not something that can be expected. As the point of a hidden agenda is its inadmissibility so an open declaration of its existence was hardly likely. Economic rationalization dictates that the US will continue to try and procure crude oil at the cheapest rate. Therefore, crude oil procurement from the Middle East will inevitably continue, which is why the US continues to have a military presence costing approximately \$4 billion per annum in Saudi Arabia.

The proposal to strengthen relationships with Canada and Mexico in the "North American Energy Network Initiative" was noticeable in the new policy.³¹ I believe that the idea came from the "American Energy Self-sufficiency Initiative."

The support given to the Bush administration's proposal of the ANWR is from an unexpected quarter. The American labor unions (who traditionally tend to back the more environmentally friendly Democratic Party) together with the American Petroleum Institute announced their support for the Bush administration. This was because the relief in the supply of energy and the reduction in crude oil prices from the development in Alaska will improve America's industrial competitiveness and will create 700,000 new jobs. Energy security is moving with a momentum beyond party politics. On 18 April 2002, however, Congress rejected this proposal.

4. China's energy strategy

In contrast to the Chinese threat espoused by the disciples of the geopolitical approach, the followers of the market analysis approach suggest otherwise. Despite the Chinese government's pronouncements that oil is a strategic product, a careful observation of their actions would suggest that, rather surprisingly, their decisions are based on non-strategic reasons.

As shown in figure 18, China imports much of its crude oil from Oman and Yemen. This is because as China's refineries have limited capabilities of desulfurization, the "sour" crude oil from Iran, Iraq, Saudi Arabia, or Kuwait, which is high in sulfur, is incompatible with its

refinery capabilities.³² Although China is making direct investments into foreign oil fields, most of the crude oil produced is not imported into its domestic market, but is sold to other countries, and thus does not contribute to China's own security³³. Some contend that after China becomes a full member of the World Trade Organization and a player in the global markets, the unproductive state oil companies, which are currently conveniently tucked away, are bound to come to light.

Figure 18—China's sources of crude oil

| Country | Share of Total Imports (%) |
|----------------|----------------------------|
| Oman | 13.7 |
| Yemen | 11.3 |
| Indonesia | 10.8 |
| Iran | 10.8 |
| Angola | 7.9 |
| Saudi Arabia | 6.8 |
| United Kingdom | 6.0 |
| Norway | 5.5 |
| Vietnam | 4.1 |

SOURCE: Fan Wenxin, "China's oil trade hits record highs in 1999," *China Oil, Gas and Petrochemicals*, Vol. 8, No. 3, 1 February 2000, p. 13.

5. East Asia energy network

According to the interdependence theory, as countries become more dependent and a mutually vulnerable and sensitive relationship develops, war is less likely to break out although disagreements will continue to exist.³⁴ In the development of energy, establishing long-term business relationships on international projects will increase the potential for bilateral friction. These projects will be building long-term infrastructure, that should have a service life of many decades, such as international long distance pipeline and electrical networks. In a simple scenario, a unilateral decision to halt supply will have a negative impact on the economy of the importing country. If, however, the relationship is one based on a long-term business, the supplying country will be dependent on sales revenue from the joint infrastructure project, and will also be affected by a sudden halt. This is an example of a mutually vulnerable and sensitive relationship.

During the early 1980s, dubbed the "new cold war," the Reagan administration asked the European Union (EU) to jettison plans for a pipeline importing natural gas from the USSR, but the EU disagreed citing the theory of interdependence. If the Soviet Union was dependent on the revenue from gas sales to Europe, a mutually vulnerable and sensitive relationship would form, which would mean that disputes would be less likely to descend into war. The rest is

history: Western Europe and the USSR continued to have disagreements but no military clashes. Of course the problem is not that simple. At the time, the pipeline network within COMECON nations was used by the Soviet Union to subordinate and turn its neighbors into satellite nations. Thus, the result was not one of interdependence but one-sided. Although the satellite countries became more dependent on the Soviet Union, this was not reciprocated. The transactions would not have taken place in a free and transparent market, as the prices were so low they were almost donations. During the cold war, Western Europe was not too dependent on the Soviet Union and was therefore in a different position from Eastern Europe.³⁵

In Asia and Japan, the construction of a natural gas pipeline network connecting the countries of East Asia has long been advocated. Where large gas fields are connected by land, a pipeline is feasible. For example, in Western Siberia and the North Sea, or Alaska and the Gulf of Mexico. In East Asia however, the gas fields are small or medium sized and interspersed throughout the regions. Furthermore, the cost of an offshore pipeline, which is more expensive than an onshore pipeline, could be prohibitive. Also, certain historical issues in Northeast Asia, if unresolved, would also be a barrier. For Japan in particular, the preparation of the infrastructure for LNG is also given as a reason.

In October 2001, I had the opportunity to visit several state-owned energy companies on a research trip to Southeast Asia. In Indonesia, the president and CEO of the state-owned (now in the process of privatization) petroleum company Pertamina³⁶, Baihaki Hakim, gave an outline of their new business strategies and, with a map of Southeast Asia in his room, talked of building a pipeline network.

In Thailand, I met Jaru-Udom, former president and CEO of a development company in the Joint Development Area (JDA). The right to the Gulf of Siam has been the thorn in the side between Thailand and Malaysia. The result of a search for common ground was cooperation in developing this area by the JDA. Based on the success of his experience, Jaru-Udom was looking into the construction of an East Asia pipeline network. He said that Singapore as the center of the network was trying to become the hub of natural gas transportation³⁷. As a city state, Singapore relies on imports for all of its energy, but domestic demand for natural gas remains at a minimum. Regardless of this, it is making use of its geography and has a grand design to place energy with its other businesses including ocean container transportation, air cargo transportation, financial services, and information technology.

Conclusion

Oil will continue to be the primary source of energy for the next 20 years, at the very least. In this article, I have looked at the impact oil has had on bilateral relations, and its future prospects. The two approaches on energy security that have evolved, the geopolitical and the market

analysis approach, have been examined. A decade has been and gone since the end of the cold war and the world has been forced into a new era by the simultaneous terrorist attacks of September 11 in 2001. On the one hand, from a market analysis approach, the age of globalization and marketing has been positive as the market pursues increased profits for the international community as a whole. On the other hand, a cool geopolitical focus which prioritizes national interests is also being pursued. These different perspectives should not be considered mutually exclusive but as complementary in energy security.

Appendix 1—Disruptions to supply of oil since 1951

(Source: US Department of Energy)

| Date of <i>Net</i> Oil Supply Disruption | Duration (Months of <i>Net</i> Supply Disruption) | Average <i>Gross</i> Supply Shortfall (Million B/D) | Reason for Oil Supply Disruption |
|--|---|---|---|
| 3/51-10/54 | 44 | 0.7 | Iranian oil fields nationalized May 1, following months of unrest and strikes in Abadan area. |
| 11/56-3/57 | 4 | 2.0 | Suez War |
| 12/66-3/67 | 3 | 0.7 | Syrian Transit Fee Dispute |
| 6/67-8/67 | 2 | 2.0 | Six Day War |
| 5/70-1/71 | 9 | 1.3 | Libyan price controversy; damage to Tapline |
| 4/71-8/71 | 5 | 0.6 | Algerian-French nationalization struggle |
| 3/73-5/73 | 2 | 0.5 | Unrest in Lebanon; damage to transit facilities |
| 10/73-3/74 | 6 | 2.6 | October Arab-Israeli War; Arab oil embargo |
| 4/76-5/76 | 2 | 0.3 | Civil war in Lebanon; disruption to Iraqi exports |
| 5/77 | 1 | 0.7 | Damage to Saudi oil field |
| 11/78-4/79 | 6 | 3.5 | Iranian revolution |
| 10/80-12/80 | 3 | 3.3 | Outbreak of Iran-Iraq War |
| 8/90-10/90 | 3 | 4.6 | Iraqi invasion of Kuwait/Desert Storm |
| 4/99-3/00 | 12 | 3.3 | OPEC (ex. Iraq) cuts production in effort to increase prices. |

Notes

¹ The basic goal of the Japanese Energy Policy is to “achieve a secure supply of energy while responding to the demands for environmental protection and increased efficiency,” and specific strategies to achieve this basic goal had been discussed at the Advisory Committee for Energy under the auspices of the Minister of Economy, Trade and Industry since April 2000, and detailed proposals were publicly announced in May 2001. In the United States, a new energy policy was announced in May of last year under the leadership of Vice-President Dick Cheney, and it has been debated in the legislature and has now moved to budgeting and legislation.

² I traveled to various countries in Southeast Asia toward the end of October 2001 as part of my research on several energy policies. It was noteworthy that while Malaysia has a public oil and gas corporation which was vigorously participating in the market encouraged and led by the government, Thailand, in contrast, was actively deregulating in order to let the market mechanisms kick in.

³ Research on natural gas is increasing and the results would suggest that a technical revolution is necessary to enable natural gas to be used as fuel. Also, the infrastructure to enable this use practical are the keys to making natural gas a primary energy source comparable to petroleum. See Kazuhiko Fujii *Sekiyū Shinwa [Myths about Oil]*(Tokyo: Bungeishunju, 2001).

⁴ Yoshinobu Yamamoto, *Kokusaiteki Sohgoizon [International Interdependence]* (Tokyo: University of Tokyo Press, 1989), p. 11.

⁵ Robert O. Keohane and Joseph S. Nye Jr.,

⁶ Yamamoto [1989] p. 29.

⁷ According to Huntington [2000] p. 168, the real meaning behind the Persian Gulf War was that it was the first clash between civilizations over oil resources since the end of the Cold War. The war was over which civilization (the Islam world or Anglo-America) had control over the world’s greatest resource deposits.

⁸ In 2001, oil production started to turn around and the continuous drop in production which had continued since the breakup of the Soviet Union came to an end.

⁹ According to a forecast by R. Ebel, Energy Research Director of the Center for Strategic and International Studies (CSIS) made during discussions with the author in Washington D.C., production from the Caspian Sea should be around 2.5 million barrels per day by 2010, accounting for a 3 percent share of the world’s production.

¹⁰ Yuji Nakamura, “National Strategy behind the Energy Policy of the Bush administration.”

¹¹ Comments made by Mr. Ishii of the Japan National Oil Corporation hint at this distinction. This had also been made several years earlier by Bill Martin, the former assistant director of the Energy Department, according to M Lynch of the Massachusetts Institute of Technology.

¹² This is a point made by Koyama, who has a career in the oil industry and currently works at the Cambridge Energy Research Association (CERA) where Daniel Yergin is the current director.

¹³ Amy Myers Jaffe, “Japanese Energy Security and Changing Energy Markets: An Analysis of Northeast Asian Energy Cooperation and Japan’s Evolving Leadership Role in Asia,” The Center for International Political Economy and The James A. Baker III Institute for Public Policy, Rice University, (May 2000).

¹⁴ For detailed data, see Appendix 1.

¹⁵ From comments made at the “Thinking About Energy Security” 30 November 2001 Symposium sponsored by Asahi Shimbun and others.

¹⁶ Jaffe, Japanese Energy Security.

¹⁷ Tatsuo Hatta, “Efficiency of Supply, Stable Supply and Environment Conservation” 2000.

¹⁸ Jitsurū Terashima, “International and Geopolitical Trends Concerning Energy Security,” 2000.

¹⁹ Kent E. Calder, *Pacific Defense: Arms, Energy, and America’s Future in Asia*.

²⁰ RAND, Project Air Force, Erica Strecker Downs “China’s Quest for Energy Security,” 2000. p. 43; Choon-ho Park and Jerome Alan Cohen “The Politics of the Oil weapon” *Foreign Policy* no. 20, fall 1975, pp. 28–40, Ronald C. Keith [1986] pp17–78.

²¹ RAND, Project Air Force, p. 23.

²² *Ibid.*, p53.

²³ *Ibid.*, p48.

²⁴ Terashima, International and Geopolitical Trends.

²⁵ On a geopolitical approach, the Royal Institute of International Affairs (RIIA,) takes the view of relative interdependence. Within the market analysis approach, Fesharaki of the East-West Center in Hawaii takes a position of realism. See Fereidun Fesharaki, *Asia and Pacific Energy Risks*, (Tokyo: Japan Broadcast Publishing, 1995).

The position of both sides was not addressed in detail in this report, but is a subject for future investigation.

²⁶ The optimistic view (M. Lynch of MIT) and the pessimistic view (former Amoco engineer, Campbell) continue to be the subject of debate. Recently, the optimistic view appears to have gained the upper hand. For details of the debate, refer to Fuji [2001].

²⁷ Comments taken from R. Manning at the “Thinking about Energy Security” 30 November 2001 Symposium sponsored by Asahi Shimbun Publishing Co. and others.

²⁸ Terashima, International and Geopolitical Trends.

²⁹ Comments by Professor M. Foss.

³⁰ For details, see Yuji Nakamura, “National strategy behind the energy policy of the Bush administration.”

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- ³¹ National Energy Policy Development Group (2001), Chapter 8-8.
- ³² This was a point made by both Koyama and the RAND Institute, pp.31–32.
- ³³ This was pointed out by R. Ebel, Energy Research Director of the Center for Strategic and International Studies (CSIS) in Washington D.C. It was also pointed out by the RAND Institute [2000] p. 54
- ³⁴ Yamamoto [1989] p. 23.
- ³⁵ There have been suggestions that a guideline was set to keep Western European dependency on natural gas from the Soviet Union below 30 percent.
- ³⁶ The move towards privatization is proceeding, and the privatization proposal passed through the Diet at the end of October of last year.
- ³⁷ Frances Lai [2001] “Maritime Security in South east Asia: Issue and Perspectives” IIPS, p. 10.

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