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JAPANESE ENERGY SECURITY AND CHANGING GLOBAL ENERGY MARKETS:
AN ANALYSIS OF NORTHEAST ASIAN ENERGY COOPERATION AND JAPAN'S EVOLVING LEADERSHIP ROLE IN THE REGION

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Introduction

For Japan, energy and security are inextricably intertwined. Part of this reflects simple economic reality. Japan, the world's fourth-largest consumer of energy after the United States, China and Russia, must import over 80 percent of its energy needs. Japanese policy-makers and the general public alike are painfully aware of the vulnerability that this dependence creates. Indeed, from its expansionist role in World War II to its activist industrial policies of the 1970s and 1980s, energy security has played an important – and sometimes overriding – role in Japanese foreign and domestic policy.

Compounding this sense of vulnerability is Japan's national experience at the end of World War II and during the first years of American occupation – years of collapse for the Japanese economy and physical hardship for the Japanese people. Japanese do not have to imagine the consequences of being cut off from access to energy and other resources; they have experienced it. This gives energy security a political salience in Japan that it does not have, for instance, in the United States.

A driving factor shaping Japanese energy policy for the past three decades has been fears of an oil disruption. To counter this risk, Japan has created national oil companies, heavily regulated its energy sector, imposed high energy taxes, created national stockpiles, diversified primary energy resources through government mandate, initiated diplomatic efforts in the Middle East and purchased oil fields abroad, to name just a few measures. But these policies have been costly, and questions are now being raised about the advisability of continuing them.

Such a reassessment is not surprising. After all, this "resource-poor island nation" has registered extraordinary economic achievement despite its energy vulnerability. Annual oil import bills in excess of $50 billion have not stopped Japan from running yearly trade surpluses twice or more that level. Major oil shocks in the 1970s and 1980s and the Gulf War in 1990, though challenging at the time, are in retrospect evidence not of Japan's weakness but its resilience; Japan weathered these shocks and continued to experience strong economic progress overall. Indeed, when Japan finally ran into economic trouble during the 1990s, it was during a period of relatively low international

energy prices. All this suggests that concerns about Japan's vulnerability may be exaggerated, implying that the costs of sustaining elements of its traditional energy security policy – notably a highly regulated, administrated rather than market conforming domestic energy sector – may have become unacceptably high.

There are, however, additional factors complicating this conclusion – ones of which Japanese decision-makers are acutely aware. Most importantly, the expected dramatic increase in oil use in Asia --including a large jump anticipated for the Asian giants, China and India-- could contribute, if not properly managed, to rising oil prices or even foster destabilizing competition for oil supplies if not properly managed. Another is the altered geostrategic environment created by the end of the Cold War and, specifically, the effect it might have on the US-Japanese relationship, long the cornerstone of Japanese security and now the key protection against disruption of Japanese energy supplies.

The issue of energy security for Japan is both complicated and sensitive. Japanese policy makers must give serious consideration to the challenges of energy security in forging new economic policies –such as deregulation and privatization-- that will stimulate sustainable economic growth. Whatever policy Tokyo pursues could have dramatic effect not just domestically but internationally as well. A movement away from nuclear energy on economic grounds or as a response to domestic political pressures, for instance, could dramatically increase Japan's oil import levels. In a tight oil market, this would fuel competition for supply, significantly bloat Japan's oil import bill and put pressure on international oil prices. Alternatively, renewed emphasis on developing Northeast Asian natural gas markets --with Japan as the major demand hub-- could serve as a brake on Tokyo's role in the Asian race for Middle East oil and enhance its cooperation with other regional powers such as Russia and China. Japan could also increase research and development of new energy technologies, creating more pressure on oil producers to hold prices low as well as stimulating greater energy efficiency at home without heavy reliance on nuclear fuels.

This paper takes a broad look at these and other issues –economic, political, geostrategic and cultural—that are shaping Japan's evolving approach to energy security. Energy markets are undergoing rapid change, and Japan's leaders recognize that this change requires policy reevaluation and adjustments. Specific subjects to be addressed

include, inter alia, the historical record of disruption in world oil supply, the future outlook for oil markets, the future rate of growth in Japanese oil demand; diversification of Japanese energy supply; the need for deregulation in the Japanese energy sector, particularly with regards to electricity and gas; the security of Japan's access to imported energy and the importance of the ongoing evolution of the U.S.-Japan security alliance to this access; and the prospects for Northeast Asian energy cooperation to facilitate energy security in the region. The report also covers the critical questions of the future of nuclear energy in Japan and the potential role of increased natural gas imports from the Russian Far East. Finally, this paper examines the complex risks that could threaten Japanese energy security in the years to come with an eye to helping to identify the proper trade-off between diversification of supply, economic liberalization and national security.

The Outlook for International Oil Markets and Its Influence on Japanese Energy Policy

History has shown that the kind of oil disruption most feared by Japanese policy makers--the accidental loss of oil through war, revolution or natural disaster—have been relatively infrequent and short in duration. In addition and perhaps more importantly, the nature of oil markets has changed so dramatically that the chances of Japan actually losing access to physical supply of oil during one of these disruptions is reasonably small. Even in the unusual circumstances of a major war, Japan's successful security alliances, especially its bilateral security arrangement with the U.S., are enough to protect its access to vital oil supplies. Given this fact, Japan's robust response to its anxieties about oil security may not only be unnecessary, it could be counterproductive. Japan's draconian energy measures are among the factors holding back economic recovery and sustainable growth.

In the 1970s and early 1980s, it was realistic for Japan to fear that a disruption to exports from one of its major oil suppliers would leave it devoid of vital energy requirements. In those days, oil was traded under long-term, bilaterally negotiated contracts at fixed prices. A clear thread linked the disruption to the shortfall. A particular barrel lost in exports was neatly matched to a particular barrel lost to a

particular buyer who had a contract for that barrel. Little recourse was available. Barrels were moved around the world like pieces on a chessboard, and there was no other *deus ex machina* to mitigate or alter the impact of any shock if one's particular barrels were lost. Lucky buyers whose supply chains remained in tact could continue to receive their oil at prices locked by long-term fixed price contracts at pre-crises levels. In a word, some buyers were safe, and others were not. That made diplomacy, diversification strategy, national oil companies and the like a useful protection to instability in the Middle East (Horsnell).

Today's world is radically different and thereby requires different policy responses. The rise of global commodicized oil markets means that during a disruption, market auction practices will allocate supplies to the highest bidder. Price arbitrage will ensure that a price increase for one buyer or location will be a price increase for all buyers and locations. Buyers cannot insulate themselves from price jumps by holding long-term contracts since prices in these contracts are pegged to the spot market.

The good news is that in today's market one can always get the oil one desires even in a major supply disruption. The problem will simply be the price paid. At the end of the day as the market clears, a buyer with imports from countries that were not subject to disruption will be in no better position than a buyer who had all of it imports subject to interruption.

Given the nature of today's markets, securing supply lines is no longer the dominant issue, and therefore, the benefit of buying oil at a premium to ensure supplies come from a wide variety of distant geographic locations is reduced. If oil is disrupted anywhere in the world, the price of all supplies are affected. The buyer need only pay his premium during the crisis, and not on a continuous basis. During the disruption, the highest bidder can buy replacement barrels from the spot market from many different locations. Today, the dominant issue is to muster the resources to pay for remaining available supplies if the price should rise exorbitantly by the auction process. In this new commodicized market, Japan, as a wealthy country, has less to fear than less fortunate countries. During a crisis, it will be able to buy the oil it needs. It will be other poorer consumers who will have to learn to live with less rather than foot the rising energy bill.

It need be noted, however, that there is one caveat to this description of oil markets in the new millenium. While there is no question that this outline fits the case of an oil disruption in normal times, Japan must also evaluate its situation in the unusual times of war. However, as discussed later in this paper, Japan's tight security relationship with the U.S., combined with the limited naval power projection capability of its neighbors, means Japan is similarly unlikely to lose access to its oil supplies during the unusual time of world conflict.

Still as a major importer of oil, mainly from the Middle East, Japan must consider the long-term outlook for international oil markets and for the stability of the Middle East. That is because while Japan might be in a position to "buy" whatever supplies it needs even during a disruption, the cost of those supplies has economic implications. The nature of today's oil markets is such that whatever one country may do to reduce the consequences of supply interruptions will benefit all oil importing countries. This reality argues for a multilateral approach toward oil security policies.

The International Energy Agency's "business as usual" estimate for total world oil demand for 2010 of 93.8 million barrels a day represents a credible median point among forecasts for world oil demand by top analysts. By comparing this demand estimate to similar forecasts for world oil supply, it is possible to illustrate the most probable market surpluses or deficits over the next decade and determine the impact that rising Asian oil use might have on oil geopolitics.

Non-OPEC oil production has expanded by 1 to 1.5 per cent per annum between 1988 and 1997 despite prolonged periods of weak oil prices. This was accomplished though a combination of technological advances in discovery and drilling systems and unearthing of new basins in South America, in deep water and elsewhere. Non-OPEC production fell by 0.7% in 1998 but rose by over 800,000 b/d, about 2%, in 1999. Moderate increases in non-OPEC production are expected to continue beyond the year 2000 as increases from the North Sea and Africa continue to materialize.

Under projections that non-OPEC production reaches 49 million b/d by 2010 –a growth rate of 1% per annum, slightly slower than over the 1987-1997 period –expected growth in Asian oil use would not exceed market supply. Rather, some 2 to 3 million b/d of excess productive spare capacity would likely still be available to world oil markets,

about the amount currently shut in by OPEC. By contrast, were non-OPEC production to rise by the same rate as over the past ten years to 54 million b/d, Saudi Arabia and other Persian Gulf producers would have to withhold 3 to 4 million b/d of productive capacity to avoid the collapse of oil prices.

Persian Gulf oil producers are also debating reopening their hydrocarbon sectors to Western investment. Under such a scenario, heightened competition for market share in Asia among Persian Gulf producers can be expected, potentially eliminating the ability of Saudi Arabia to maintain a price premium on Asian sales. By 2010, an additional one million barrels a day of OPEC condensate liquids production, as well as another 7.7 million b/d of capacity expansion, is possible from Iran, Iraq, Kuwait and the United Arab Emirates (UAE).

Iran has already begun inviting Western oil companies into its oil and gas fields with an eye to expanding capacity. Iraq is working keenly with its supporters at the United Nations to try to arrange an easing of economic sanctions to allow Western and Russian oil companies to enter its upstream sector to refurbish existing fields and develop new ones. The recent lifting of the ceiling on United Nations-sponsored humanitarian oil sales is the first step in this process. Kuwait and Saudi Arabia will feel more pressure to reopen their oil sectors –or at least to expand capacity—once Iraq and Iran begin to show potential for production increases. Therefore, it is likely that all countries in the Persian Gulf will have major programs to raise capacity over the next decade.

Besides increasing supply from the Persian Gulf, Asian buyers may resort to increasing supply sources from Africa. Renewed Western investment in Algeria and Libya could also add another 1 million b/d or more of incremental sweet crude supplies in the next five years. American companies have recently begun discussions with Libya about reestablishing operations once U.S. economic sanctions are eased. And, over 1.5 to 2 million b/d in gains are also expected from offshore Africa and from inland markets such as Sudan, Chad and Nigeria.

Under a scenario where oil consumers face diverse, ample supplies and substitutes, more integrative policies such as energy market deregulation and regional integration, cooperative infrastructure and stockpiling ventures, and joint investment in technological innovation might be enough to assuage Asian energy security concerns.

Also, ample energy supplies would temper the impulse toward more confrontational, warmongering-style, solutions. Well-known oil historian Daniel Yergin argues that in the future, "stresses can be resolved not through massive armies and blue-water navies, but through markets and investment within the ever-denser web of international commerce."[i]

Unfortunately, the appealing reality, from Japan's consumer-oriented perspective, of this long-term outlook for supply sits in contrast with the immediate market environment. Sustained periods of low prices as seen in 1998 tend to reduce investment in oil production capacity expansion, curtailing the amount of spare productive capacity to be tapped during crisis or disruption. The reduction in spare capacity facilitates cooperation among oil producers who have less volume shut-in and thereby less incentive to cheat on production quotas and increases the power of producer cartels to boost prices for a while. The power of an oil-producing cartel such as OPEC is particularly enhanced if the reduction in spare capacity should coincide with a crisis or disruption (Horsnell).

Sustained high prices as seen in recent months, by contrast, tend to bring capacity on stream, and in the longer term reduce the power of a cartel to maintain those high prices. Over time, this process brings a periodic cycling of spare capacity, frequently correlated with price swings. These periods of tightening of oil markets can happen even in the absence of political turmoil or hostilities.

Despite the recent rise in oil prices, questions remain about whether the proper amount of investment will be made to expand current capacity sufficiently to cover rising demand over the next year or two. The barriers to this investment are less economic than political. There are some key countries whose ability to expand capacity has been constrained by sanctions or lack of access to capital, especially Iran, Iraq and Libya. Moreover, within the Arab Persian Gulf, some of the key fields that have provided the mainstay of production are now showing signs of aging, but regimes, pressed to allocate budgets to social spending, are not making the necessary investments in their oil sectors. These factors have left oil markets today with a dangerously low margin of spare productive capacity.

Within this context of more limited spare productive capacity and current low world oil inventories, the impact of any short-term supply disruption could potentially be

greater today than at any time since 1951. Still, even with this short-term risk, it may not be economically justifiable to maintain expensive energy security measures simply to avoid a shock which past experience has shown is likely to be of short duration. Rather, occasional shocks should be overcome by utilizing emergency stockpiles –both through the continued maintenance of national stocks and through the augmentation of international and regional cooperation on joint stockpiling systems.

Indeed, while popular opinion might hold that sudden shocks to oil markets as the result of Middle East events, such as revolution and war, are the "primary risk to energy security and are happening with increasing regularity, the reality is just the opposite. A survey of events that caused a gross loss of oil to the market of more than 50 million barrels shows that of the ten such events since 1951, only one –namely the Gulf crisis has occurred after 1980 (Horsnell).

Significant Middle East and North African Oil Crises, 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

But acts of war or natural accidents are not the only kind of interruptions that can influence the flow of oil. There are several other kinds of discontinuities that can emerge to affect prices. More common is a policy-related discontinuity that comes about when

oil producers with spare capacity alter supply decisions such as recently seen within the Organization of Petroleum Exporting Countries (OPEC) and Mexico. Japan and other consuming countries lacking military capability to influence trends in the Middle East may feel powerless to sway OPEC's decisions. History has shown that Japanese diplomacy, investment and foreign aid programs have for the most part failed in influencing OPEC. However, Japan and other consuming countries can counter OPEC's monopoly power in energy markets to the extent they support research and development for alternative energy technology. Development of a substitute technology can lower the oil price before it is actually invented or utilized. An alternative technology could potentially decrease Japan's dependency on OPEC. Therefore, investment in such technologies should work to influence OPEC to sell as much oil as possible before the substitute technology is created (Ohno/Miyagiwa).

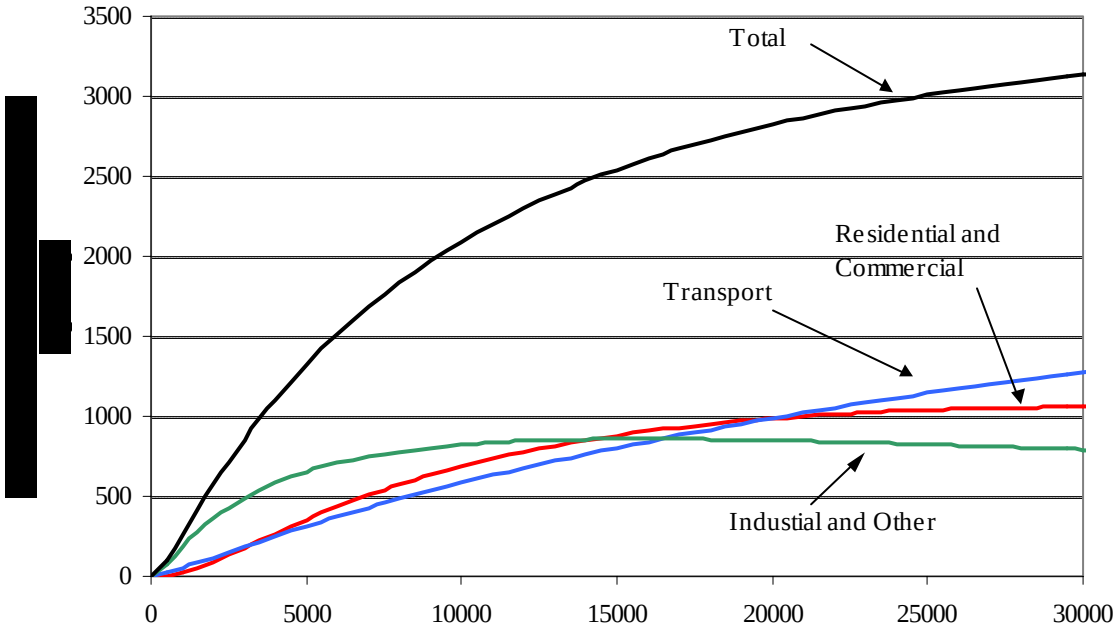
The Outlook for Japanese Oil Demand to 2015

Japan has been very successful to date in promoting energy efficient practices and diversification from oil. Japan's oil consumption has been relatively stable in recent years, rising from 4.8 million barrels a day (b/d) in 1988 to 5.7 million b/d in 1999. This compares to soaring oil use in neighboring countries such as South Korea, whose oil consumption rose from 740,000 b/d to 2.35 million b/d over the same period, or China whose consumption doubled. Oil has been reduced from 77% of Japan's total primary energy consumption in 1973 to 55% in 2000 as a result of diversification toward nuclear energy and natural gas, conservation and a structural shift in Japan's economy away from heavy industry toward services. From 1980 to 1995, the country's energy intensity, that is, the amount of energy needed to produce goods and services, was reduced from 0.22 kilograms of oil equivalent per constant 1985 dollar to 0.18 kg of oil equivalent, making it one of the most energy efficient countries in the world.

This declining energy intensity trend will be harder to sustain in the coming decade, however, as Japan's industrial sector continues to shrink and conservation and efficiency will increasingly have to be wrought out of the transportation and residential sectors. Although economic development leads to declining growth rates of per capita

energy demand in the industrial sector, there is substantial growth in energy demand in the transportation and residential and commercial sector. As per capita incomes rise, consumers devote a larger proportion of their income to durable goods such as air-conditioners, furnaces, refrigerators, and automobiles. Since these items require some energy input to produce a flow of services, energy demand increases. But there is a limit to how much growth can come from this kind of personal consumption. That is, there exists a saturation effect in demand for services that require energy input (Medlock, Soligo).

Simulated Per Capita End-Use Energy Demand



Still, the continued accumulation of wealth, combined with the current limits on conservation technologies in the transport sector, point to a significant rise in energy use in Japan. Total primary energy use is expected to rise from 480 million metric tons of oil equivalent (mtoe) in 1995 to 673 to 717 million mtoe by 2015, assuming Japan's GDP

growth averages 1.5% to 3.5% over the period. As discussed, a significant portion of this rise will have to be met with oil.

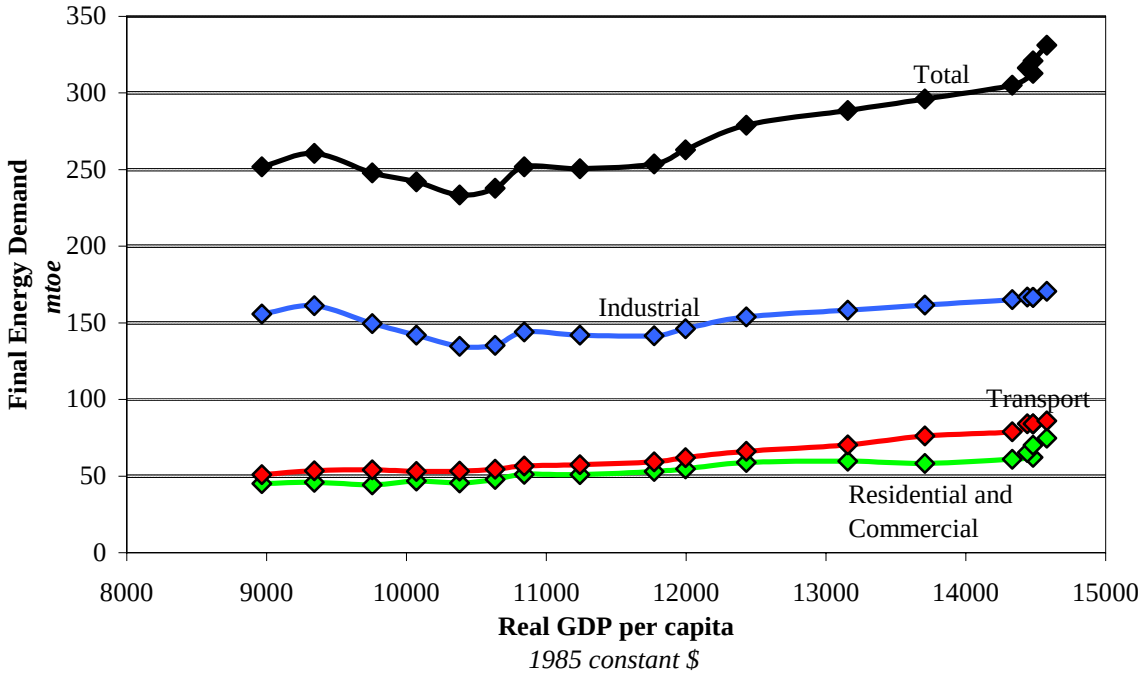
Japanese Energy Demand Forecasts to 2015

	1995	PROJECTED – 2015		
		LOW	BASE	HIGH
CONSUMING SECTOR		***1.5%***	***2.5%***	***3.5%***
RESIDENTIAL AND COMMERCIAL	**74.7**	**156.1**	**161.4**	**165.3**
TRANSPORTATION	**85.9**	**131.3**	**145.6**	**160.5**
INDUSTRIAL AND OTHER	**170.6**	**177.2**	**174.1**	**169.0**
TOTAL FINAL CONSUMPTION	**331.2**	**464.6**	**481.0**	**494.8**
TOTAL PRIMARY CONSUMPTION	**480.0**	**673.3**	**697.5**	**717.1**
REAL GDP PER CAPITA	**$14,578**	**$19,634**	**$24,358**	**$29,007**

NOTES: (A) ENERGY UNITS ARE MILLION METRIC TONS OF OIL EQUIVALENT. REAL GDP PER CAPITA IS 1985 INTERNATIONAL $. (B) TRANSFORMATION LOSSES IN 1995 WERE 30%. THUS, TO OBTAIN PRIMARY, WE ASSUME THIS VALUE.

The Baker Institute forecasts indicate that oil use in the transportation sector could rise by as much as 70% between 1995 and 2015, increasing the share of the transport sector in total oil use from 37.2% to 43.1% of final consumption. Oil use in the residential and commercial sector is predicted to increase by 116%, assuming the share of various energy sources remain at 1995 levels. The share of total oil used by the residential and commercial sector increases from 17% to 25% of final consumption. By comparison, oil demand in the industrial and other sectors will only increase by less than half of 1% (Medlock, Soligo).

Japanese End-Use Energy Demand by Sector



Ultimately, growth patterns for Japanese oil use in the coming decade or so may still be heavily influenced by energy diversification policies. Japan's Ministry of International Trade and Industry (MITI) continues to target increases in alternative energy sources such as nuclear energy and renewables but implementation faces both political and economic hurdles. Under scenarios where oil continues to lose market share to other fuels and conservation, the Baker Institute projects Japanese oil imports to rise by only 900,000 b/d to 1.6 million b/d by 2015 to a total of 6.6 million b/d to 7.3 million b/d (Medlock, Soligo). This compares with a more substantial rise for China of between 2 to 5 million b/d over the same period. Under such a scenario, Japan's economic growth will not be a critical factor in pitting it increasingly in competition for oil supply with its neighbors or fueling increasing tightness in international oil markets. Japanese policy makers can take a more relaxed view in reevaluating oil security policy.

Nuclear energy has played a major role in reducing Japanese reliance on oil. But, popular sentiment in Japan is increasingly turning against nuclear power. Were Japan to shift away from increasing the share of nuclear power in its energy mix, the amount of

incremental oil imports might rise from the 900,000 to 1.6 million b/d projected above to as much as 2.2 million b/d to 3.1 million b/d, significantly augmenting its influence in emerging global oil market trends and in Asian competition for energy resources (Medlock, Soligo). (See Appendix for more details).

Japan's Diversification Strategy

The pros and cons of nuclear power

Since the 1973 oil crisis, a top priority of the Japanese government's policies has been development of alternative energy sources to oil. Nuclear power has contributed significantly as an alternative to oil. Japan's dependence on oil for electricity generation declined from over 70% in 1973 to about 15% in 1998, mainly through substitution of nuclear power and natural gas. However, the future of nuclear energy in diversification is uncertain.

To promote energy diversity, Japan needs to continue to avoid dependence on any particular source of energy. Japan leads the world in diversity of energy sources for electric power with a diversity index of 1.56, far exceeding the OECD average of 1.48. Japan enjoys a well-balanced mix of nuclear power, natural gas, oil, coal, and hydroelectric power. To the extent that the share of nuclear power rises above 40%, Japan's degree of energy diversity could actually worsen (Suzuki).

Against the backdrop of potentially diminishing diversification returns, nuclear power in Japan faces several other challenges in the years ahead. Arguments that nuclear power is the most preferable energy source because it is domestically produced, and thereby more secure, may hold less water in coming years as economic forces are increasingly brought to bear. Procedures followed in designing and operating nuclear power plants in Japan reflect sound engineering practices, and it is generally expected that nuclear energy can be maintained with manageable disruptions (Sickles, Spanos). But nuclear fuel availability and access to recycling activity reprocessing can be affected by international politics and therefore like other fuels can fall outside the control of the

Japanese government. The more a nation depends on plutonium for its nuclear energy, the more that nation can be affected by international events such as proliferation or terrorism. Uranium production can also be subject to political events. Moreover, given the risks to nuclear facilities from earthquake or accident, high construction costs for new nuclear power plants may make their electricity rates uncompetitive in a transparent, deregulated marketplace. The disposal costs for spent fuel are also rising, further worsening the potential profitability of nuclear facilities.

Aware of the problems nuclear generation may face, the Japanese Central Research Institute of Electric Power Industry estimated the future costs of nuclear facilities. They project costs of existing nuclear power plants to drop to 5.10 yen per kWh in 2010, from 7.23 yen per kWh in 1996. However, for new nuclear power plants, costs are estimated to rise to 9.93 yen per kWh in 2010. A review of the cost components of nuclear power generation shows that for existing nuclear facilities, capital cost, which accounted for 48% in 1996, will drop to 27% in 2010, while recycling costs will increase to 35%. Operating costs will also rise in percentage. These figures make it clear how important reduction of the operating and the fuel recycling costs as well as the plant construction costs is to the competitiveness of nuclear power (See Appendix for detailed Figures).

Nuclear power plants require reliable storage and management of spent fuel. So far, the only sites to be considered in Japan have been either at power generation sites or at reprocessing plants. Down the road, so-called "interim storage facilities" will be needed since current storage capacity at generation sites or reprocessing plants is limited. Storage of spent fuel is relatively safe. It is not only economical but there are diverse storage choices, requiring less rigorous requirements than the nuclear reactor. Also, reprocessing and waste disposal schedules can be made more flexible by using interim storage.[1]

[1] The Japanese government could support the construction of interim storage in several ways. Spent fuel, which is called a "recycle fuel resource," may well deserve a national reserve, similar to the national oil reserve. To ensure secure operation of nuclear power plants and also facilitate private-sector interim storage industry, the government could make use of state-owned land for the storage of spent fuel. Specifically, a national reserve to last for about ten years (10,000 tons) would significantly reduce the burden on electric power, making it unnecessary to reprocess spent fuel. A national tanker reserve for an

But perhaps the largest challenge to nuclear power in Japan comes from public opposition. Political and social changes occurring in the mid- to late-1990s in Japan have shifted public opinion against pro-nuclear government policies. Political and economic upheaval coupled with numerous scandals involving bureaucrats and politicians have eroded public trust in the government. These factors have lead to stronger calls for policy reform. Three specific factors have played a role in elevating the degree of influence public opinion has on nuclear energy policy: 1) a series of recent dangerous mishaps involving nuclear material; 2) a general rise in local defiance of central government policy edicts; and 3) the proliferation of the Internet to organize opposition (Kotler, Hillman).

Public outcry over recent incidents involving the dangerous mishandling of nuclear materials has forced the Japanese government to alter its ambitious nuclear energy plans. In the aftermath of the well-publicized March 2000 accident at the Tokaimura nuclear facility, the Japanese government responded to increasingly bitter public protests over the safety and wisdom of nuclear power by establishing a commission to study how future development of nuclear energy should proceed. Already, several planned facilities have been cancelled or postponed.

Nuclear accidents have contributed greatly to undermining public confidence in government and corporate nuclear oversight. People feeling "very uneasy" about nuclear power went from 21% before the 1999 Tokaimura accident to 52% afterwards. In an October 1999 Japan Public Opinion Company survey, only 11% supported government plans to increase nuclear power. Fifty-one percent favored maintenance of current plants while another 33% wanted to see a reduction in or an end to nuclear power. Given a choice, the public preferred non-nuclear options (solar/wind generation 62%, conservation 54.9%, compared to 20% for nuclear power). In other words, the public does not completely accept the government's arguments that nuclear power is safe, necessary for Japan's energy security, and ecological because it does not emit smoke (For more details, see Appendix).

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emergency escape may also deserve consideration or participation in a multilateral reserve created as part

The dominant Liberal Democratic Party (LDP) fears an electoral backlash if it fails to deal with the dangers of nuclear power, and there is an increasing focus by citizens' groups on broader safety and regulatory concerns that are too big for officials to brush aside. New areas of concern have been coupled with new levers by which citizens can influence their government. Changes in voting laws, allowing some voting for individuals instead of parties, have occurred that are intended to make politicians more responsive to civic needs. Legal changes in 1998 brought Japan a national freedom of information law and legalized private non-profit organizations not sponsored by the government. These changes promise to encourage citizen activism. Whereas decision-making once almost always occurred behind closed doors, new disclosure laws now allow citizens, with considerable success, to expose the process. Finally, critics are better organized, and media is increasingly independent, backed by support from international non-government groups (NGOs) (Kotler, Hillman).

In light of changed public attitudes toward nuclear power in Japan as well as pressures for deregulation in the electricity sector, there is no question that Japanese nuclear industry will need to improve competitive performance, repair its public image and develop new ways to dispose of nuclear wastes and spent fuels. In the nuclear industry where safety must come first, the pressure of deregulation and cost-reduction is being increasingly felt. This pressure contributed also to the Tokai village incident. In Japan, nuclear fuel is said to have an economic advantage over fossil fuels, but in the future, it may have to compete with the marginal costs of Independent Power Producers (IPP) and even other nuclear facilities.

To regain people's confidence in nuclear energy, it will be necessary to review the regulation and administration of safety and also intensify voluntary restrictions by the nuclear power industry. It will be also necessary to enhance risk management capabilities to deal with nuclear terrorism and sabotage.

As a non-fossil fuel that does not generate carbon dioxide, nuclear power is considered a trump card in reducing the globe-warming gases. However, the

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of non-proliferation and disarmament programs (Suzuki).

environmental gains to come from nuclear power will only be significant to the extent it replaces coal-fired generation capacity.

Natural Gas as an alternative to nuclear and rising oil imports

Another source for diversification of energy supply to Japan is natural gas. As a potential natural gas supplier, the Russian Far East stands out as an attractive alternative to nuclear power and increased oil imports. Natural gas imports from Russia would lessen heavy reliance on the Persian Gulf and provide an environmentally sound and cost-effective alternative to nuclear energy.

Natural gas resources of the Sakhalin Islands compare favorably with other substantial regional natural gas suppliers. Even at this early stage of exploration, preliminary estimates indicate that Sakhalin proven and probable gas reserves could be as high as 50 to 65 trillion cubic feet (tcf). By comparison, Indonesia, the world's largest LNG exporter, has proven reserves of around 82 tcf. The gas resources in Eastern Russian areas are less prolific and more distant to markets. Yakutia is thought to hold an additional 35 tcf while the Kovyktinskoye field in Irkutz is estimated to have possible reserves of 53 to 105 tcf, according to Washington, DC-based consultants Planecon, Inc. These latter deposits, while large, may not be ample enough to encourage the massive investment needed to bring them to market.

The following tables outline the natural gas potential of the Russian Far East. Table 1 shows the estimated recoverable gas, oil and condensate reserves of the region. Table 2 outlines in more detail the reserves and production outlook for specific Sakhalin projects.

Table 1. Russian Far East Recoverable Gas, Oil and Condensate Reserves

	# of Fields	2-P Reserves	3-P Reserves
Natural Gas (TCF)	95	56.48	847.20
Condensate (NGL) (BN B/D)	95	3.00	11.60
Crude Oil (BN B/D)	60	2.60	66.60

Note: Proven and Probable reserves ('2P'); Proven, Probable and Possible reserves ('3-P). The Russian system of classification uses A-E categories; A, B and C1 are roughly equal to the international classification of proven and probable reserves.

Sources: ICPBS/Gapmer; Asia Pacific Consulting; Industry.

Table 2. Sakhalin Projects (Gas in TCF; Liquids in MM BBLs) (1)

Project/Fields	Status	Official Reserves (2-P)	Wood MacKenzie Estimates (3-P)	Operator's Forecast Lifetime Production
SAKHALIN I (Odoptu-More; Chiavo, Arkutun-Dagi)	1st condensate/ oil output mid-1999; gas by 2005	Gas: 6.7 Oil: 495 Cond.: 95	Gas: 14 Oil: 2,480 Cond.: 170	Gas: 15 Oil: 2,153 Cond.: 273
SAKHALIN II (Lundskoye, Piltun-Astokhskoye)	1st oil mid-1998; gas post-2005	Gas: 11.9 Oil: 481 Cond.: 241	Gas: 16.1 Oil: 647 Cond.: 240	Gas: 13-14 Oil: 750 Cond.: 330
SAKHALIN III (Kirinsky Block)	PSA pending	N/A	Gas: 24 *Oil: 3,400	Max. 24/yr
SAKHALIN IV (E. Odoptu, Ayash Blocks)	PSA pending	N/A	N/A	N/A

Note: (1) Proven and Probable reserves ('2P'); Proven, Probable and Possible reserves ('3-P'). The Russian system of classification uses A-E categories; A, B and C1 are roughly equal to the international classification of proven and probable reserves.
(2) Oil includes potential condensate reserves. Estimates are for either oil/condensate or natural bas, but not both.

Sources: **ICPBS/Gapmer; Asia Pacific Consulting; Industry.**

Japanese companies have been attempting to develop oil, gas and coal reserves in the Russian Far East and Eastern Siberia for 30 years. Their experience has been disheartening. After hundreds of millions of dollars of investment and efforts stretching three decades, the Russian Far East yielded little of commercial value to Japan; with maximum oil exports never exceeding 70,000 b/d. Politics was the main reason for the failure. The general tenor of the Cold War made both the Soviets and the Japanese

suspicious of each other's intentions. As a result, the Soviets attempted to limit Tokyo's access to the most prospective areas, and the Japanese moved cautiously on trade and investment credit. The 1979 Soviet invasion of Afghanistan led to a virtual freeze on all major hydrocarbon projects, as the U.S. pressured Japan to stop funding developments. In addition, the territorial dispute surrounding the Kurile Islands/Northern Territories remained a persistent, though minor irritant (Troner).

The problems of development were compounded by the Soviets' lack of hard currency. Many projects were based on barter and counter-trade and Japanese companies worried about repayment, as there were few goods that Tokyo wanted from the Soviet Union other than raw materials. For oil and gas projects, the basis of development was funding on a success and repayment program. Typical was Sodeco, which was paid a percentage of future oil following commercial production from the block. Sodeco made significant discoveries in the 1970s, including Odoptu and Chiavo, but once finds occurred, the Soviets proved reluctant to push for fast track commercial development, even when the Japanese offered near total funding of development costs. While Japanese company executives suspected that the Soviets wanted them only to discover new reserves, but not develop them, the Soviets accused the Japanese of not promoting technology transfer in exploration programs (Troner).

Finally, and fundamentally, both sides failed to address the rough terrain of the Russian Far East. The vast distances involved in Russian Far East gas development are daunting. Sakhalin reserves are no less than 1,000 kilometers (KM) to the northernmost island of Hokkaido and roughly 2,300 KM to Tokyo. And, these estimates assume the most direct route; yet pipeline routes are not decided solely by drawing a crayoned line on the map. Actual gas pipeline distances could be considerably greater once terrain, climate and natural hazards are weighed (Troner).

As much as distance, there are also problems of climate and terrain. Temperatures for the 'Taiga', which comprises much of the Russian Far East, can range from –30C in winter to +30C in summer. Pipeline gas must be maintained, over long distances at a relatively stable temperature, implying substantial piping insulation. While for the most part proposed pipeline routes do not cross mountain ranges, the relatively flat terrain will still need a substantial number of pumping stations to 'push along' gas

flows, even if the pipeline is designed for relatively low gas pressure. The severity of weather offshore Sakhalin results in an exploration frontier similar to the northern fringes of the North Sea – ice is normally present for 4-6 months a year and can average up to 2 meters thickness. Storms and substantial ice floes limit offshore exploration activity to less than 6 months a year. As if this wasn't a harsh enough environment, nature provides cataclysmic upheavals at regular intervals from earthquakes, massive flooding, tornados, and in some southern border regions, dust storms. Finally, problems of climate and terrain are aggravated by minimal transportation and spotty communications infrastructure (Troner).

These hardships mean that inland gas finds of the Russian Far East are likely to have substantial development costs. The development costs of the Kovtkya/Irkutsk development could fall in the range of $1.5 to $2.0 billion. The Vilyui fields of Yakutia could be even higher at $1.2-2.4 billion. Even Sakhalin-I and II have high development price tags. Exploration and development costs for the first totaled $420 million through 1999 and for the second reached $950 million by the same year. Once gas field preparation is added to the preliminary costs of getting oil/condensate production online, both projects should range in the $1.3-1.6 billion range, possibly more. Capital costs for transmission lines are also quite expensive at around $950 million to $1.4 billion from Sakhalin to Japan, excluding the cost of laying a domestic natural gas grid. Reported estimates for a Vilyui pipeline to China and Japan have been as high as $6 billion to 14.5 billion.

Japanese buyers will have a large number of choices for potential natural gas suppliers over the coming decade. Still, sales from Sakhalin, either by pipeline or LNG, could have a substantial capital cost advantage over most suppliers. Sakhalin gas is the most economical by pipeline, reaching Japan for the equivalent cost of $2.00 to $2.80 per million btu (million British Thermal Unit) as compared to Yakutia gas at $2.50 to $3.70 per mmbtu or Irkutsk gas at $2.30 to $3.60 per mmbtu. Sakhalin LNG costs are equally competitive at $1.90 per mmbtu, about equal to the equivalent capital costs for shipment from Botang LNG in Indonesia and slightly cheaper than the $2.15 per mmbtu for shipments from Australia's Northwest shelf. By comparison, least cost gas delivered from Qatar would be $2.45 per mmbtu. Actual LNG market-related import prices in

1999 were generally higher than these estimated levels for Sakhalin costs of $1.90 to $2.80 per million btu, ranging between $2.91 per mmbtu for supplies from Abu Dhabi to $3.31 per million btu from Arun in Indonesia, according to World Gas Intelligence.

LNG Comparative Costs

Country/Project	Export Capacity (MM MTA)	Distance to Japan (km)	Capital Cost (US$)	Operating Since
Qatar/Qatargas	7.1 (3x)	6,400-6,520	$6 BN w/ship & 3rd train	1996
Australia/NW Shelf	8.7 (3x)	4,500-5,300	$7.8 BN w/ship & debottleneck	1989
Indonesia/Bontang	21.5 (8x)	3,500-4,200	$7-8 BN w/new trains, debottleneck & shipping	1977 1999 'H-train, latest
Russia/Sakhalin-II (1)	6-8 (2x)	800-2,500	$6-7 BN w/pipe to S. Sakhalin, NGL plant & shipping	2005-6 target; 2006-8 more likely

Note: (1) While max. distance is from LNG plant on southern tip of island, minimum distance is from production fields to Hokkaido.

LNG Breakout of Costs (US$/MM BTU) (1)

Country/Project	Wellhead Gas Cost	Liquefac-tion Cost	Transport Cost	Regassifi-cation	Min. CIF Gas Cost
Qatar/Qatargas	0.55-0.75	0.40-0.60	1.10-1.20	0.40-0.60	2.45
Australia/NW Shelf	0.65-0.95	0.40-0.60	0.75-0.95	0.35-0.55	2.15
Indonesia/Bontang	0.60-0.80	0.45-0.65	0.55-0.75	0.30-0.60	1.90
Russia/Sakhalin-II (2)	0.70-1.00	0.30-0.45	0.50-0.60	0.40-0.50	1.90

Note: (1) Assumed US$18-22/BBL oil price.
(2) Sakhalin LNG assumes no Japan gas network.

Russian Pipeline Breakout of Costs (US$/MM BTU) (1)

Project	Wellhead Gas Cost	Distance to Japan (km)	Transport Cost (Japan Landfall)	Domestic Transport	LNG Equivalent
Sakhalin (Sak. I/II)	0.70-1.00	850	1.10-1.40	0.20-0.40	2.00-2.80

Sakha-Vilyui	0.80-1.30	6,000-6,500	1.50-2.00	0.20-0.40	2.50-3.70
Irkutsk-Kovytka	0.60-1.00	6,200-6,800	1.50-2.20	0.20-0.40	2.30-3.60

Note: (1) Assumed US$18-22/BBL oil price.
(2) Japanese national transmission network capital costs excluded from transport calculations.

LNG Comparative Costs - 1999 Actual Market Prices

Country/Project	US$/MM BTU	Price Change Vs. 1998	'000 MT	MT Change Vs. 1998
Abu Dhabi/Das Island	2.91	-11.57%	4,751	+3.62%
USA/Alaska	2.84	-8.18%	1,221	-6.29%
Australia/NW Shelf	3.27	-4.06%	7,226	+1.26%
Brunei/Lumut	2.97	-4.28%	5,483	+0.62%
Indonesia/Arun,Bontang	3.31	+21.35%	18,386	+2.20%
Malaysia/MLNG-I/II, Bintulu	2.98	-6.06%	9,903	+0.67%
Qatar/Qatargas	3.07	-4.60%	4,394	+58.69%
Total	**3.13**	**+2.87%**	**51,364**	**+4.67%**

Note: (1) In 1998, average CIF Price was $3.03; for1997 was $3.90. Average annual prices for LNG imports in recent years generally ranged from $3.20-3.50/MM BTU. If crude prices for the 2000-2005 period settle into an $18-22/BBL range, average Japanese LNG import prices will decline slightly as new 'clawback' contracts are signed.
Source: Word Gas Intelligence, 2/25/2000.

The following table calculations take in account the following:

Estimates of wellhead costs factors in the cost of producing, transporting and storing NGLs, both condensate and LPG and this raises overall gas field operating costs substantially. Yet 'wet' gas discoveries containing sizable volumes of NGLs tend to be developed, either for pipeline or LNG projects, before 'dry' gas finds. The presence of NGLs allows project to upfront revenue by producing condensate and LPG before first gas volumes are sold; these sales allow for increased rates of return on capital, as well as increased overall revenue. While wellhead operating costs rise through NGL recovery, NGL sales further increase overall project profitability. NGL production costs include stripping 'wetness' from gas, piping liquids ashore, separating LPG from condensate and the storage of both hydrocarbon liquids.

The choice of process technology used has only slight impact on liquefaction operating costs for gas conversion to LNG. Limited, though discernable, differences in liquefaction costs are attributable to the age of the liquefaction train and the climatic/geographic conditions surrounding the LNG production site. While older trains are often 'retrofitted' to upgrade conversion efficiency, the newest generation of grassroots liquefaction trains shows small reductions in manufacturing costs, not only due to more modern equipment, but also through new operational procedures that take advantage of local climatic conditions. This produces small differences for liquefaction costs according to age and location of LNG complexes.

To facilitate higher natural gas imports, Japan must resolve issues that currently block the construction of a national transmission grid. Greater use of natural gas has a clear advantage over nuclear power and oil imports in part because Japan has never experienced a major accident or disruption of its natural gas imports. Moreover, its 22 natural gas receiving terminals are no more subject to military attack than its 51 nuclear facilities. There are several groups with conflicting interests that make up the Japanese natural gas and electricity sectors. Some of these important players have entrenched positions for status quo policies. But, end-users are unlikely to continue to tolerate automatic expensive pass-on costs, creating a momentum for change in the system.

The Benefits of Energy Deregulation

In an effort to enhance the competitiveness of Japanese industry, the government must continue to restructure the domestic energy sector, moving from intrusive administrative involvement to market conforming, arms-length regulation. Because energy is a strategic commodity whose use has environmental consequences, understandably, some government regulation is needed, especially to protect social welfare in time of emergency or from environmental damage.

The Japanese government’s current extensive regulation of the energy sector (import duties, end-user taxes, and other government intervention) –combined with infrastructure bottlenecks—have led to domestic energy prices that are among the highest in the industrialized world. Premium gasoline prices in Japan, for example, are roughly

230% higher than in the U.S. and 45% higher than in the U.K. Residential electricity prices are approximately 90% and 140% higher, respectively. The economic burden associated with these higher energy costs is increasing for Japan as the competitiveness of other countries is enhanced due to deregulation of their energy sectors. As a result, Japan can no longer ignore these pressures and pursue energy industry policies of convenience domestically unto itself but must consider its interdependence to the international community (Oyama).

Reform of the Japanese electricity market will be pivotal to enhancing Japan's competitiveness and efficiency in the years to come. Currently, this market is heavily regulated, with MITI in the center of pricing, entry and planning decisions. Electricity prices are very high by world standards (more than twice as high as in the U.S. or U.K. for example) but also distorted, doing a poor job of signaling the real costs of electricity. A major obstacle to reform is that private companies own most of the facilities, and deregulation may erode their profits. This may also explain why proposed reforms have focused so far mainly on the retail segment of the market. Most of the gains from reforming electricity supply in other countries have arisen, by contrast, from exploiting technological changes that have allowed wholesale electricity markets to become more competitive. By delaying the adoption of measures in line with world best practice, Japan will be foregoing large efficiency gains and introduction of improved technologies that are benefiting the economies of other countries. Meanwhile, inside Japan, the social costs and economic pain of using heavy regulation to force end-users to pay higher costs are rising, putting Japanese policy makers under pressure (Hartley).

Successful deregulation requires an understanding of the sources of monopoly power in the industry, separation of competitive from natural monopoly elements, and a compensation package to the industry for losses expected during a transition period. Partial reforms that relax controls in the retail market while leaving monopolies in generation and transmission in place may be more harmful than beneficial. The real efficiency gains arise from reforming the generation sector and the wholesale market for power, not the retail market. In particular, the major gains from freeing up the retail market arise from having customers face prices that better reflect the marginal costs of

supply. These costs are, however, impossible to determine in the absence of a competitive wholesale electricity market (Hartley).

The 1995 Amendments to the Electric Utilities Industry Law in Japan liberalized entry rules for IPPs and required utilities to conduct tenders to meet additional thermal power needs. These changes have encouraged entry of IPPs, while the two tenders conducted to date reduced costs by between 10 and 40% below the "upper limit prices" calculated by the utilities. Such marginal increases in competition are, however, not a sufficient foundation for introducing a wholesale market in electricity. Much more radical reforms are required.

Major potential gains from reform result from reduced generating costs and prices that are more reflective of the marginal costs of production. Neither of these gains can be achieved without effective wholesale competition. If a wholesale market in electricity is introduced but monopolies in the generating sector are left in place, the result will be that monopolies can take advantage and charge much higher prices than warranted. Thus, the current heavily regulated regime thus could be less inefficient than a partially reformed system (Hartley).

Most utilities in Japan face little competition from their neighbors because of weak transmission links. A measure of competition is to analyze the amount of electricity that can be supplied by a neighboring plant as an alternative to a local supplier. Indicating its strong monopoly potential, the largest utility, Tokyo Electric Power Company can only receive at most 8.8% of its peak demand from neighboring utilities. The next two largest utilities, Kansai and Chubu, could at most receive 19% and 13.6% respectively of their peak demand from their neighbors. The smaller utilities could be placed under more competitive pressure from their neighbors. The link between Chugoku and Kyushu is 18.3% of the peak load in Kyushu. For the northern island of Hokkaido, the corresponding figure is about 14%, while for Shikoku it is a little over 24%. The utility most exposed to potential competition is Chugoku, where almost 57% of the peak demand could be supplied by the neighboring utilities. The links from Tokyo to the large utilities located to its west are particularly weak, most likely as a result of electricity frequency difference between eastern and western utilities across Japan (Hartley). (See appendix for more details).

Increasing the capacities of the transmission links would increase competition between utilities. As a first step, the links between the 50Hz and 60Hz regions need to be strengthened. Upgrading the capacities of the links would not, however, introduce sufficient competition to establish an efficient wholesale electricity market. This is because only two of the nine utilities (Chugoku and Kansai) would face competition from three others. Another three (Tohoku, Tokyo and Chubu) would face competition from two, while the remaining four (Hokkaido, Hokuriku, Shikoku and Kyushu) would face competition from just a single utility.

There are quite a few examples of functioning wholesale electricity markets in a number of countries with quite different mixes of generating capacity. The general conclusion from examining these markets is that if any one generating company has capacity equal to 25% or more of the peak load capacity, the market is not sufficiently competitive to avoid serious price distortions and accompanying efficiency losses.

The only feasible way of obtaining a competitive wholesale electricity market in Japan is to require the utilities to divest themselves of at least two thirds of the generating capacity in their home supply region. With an additional 10% of power available from neighboring utilities, that would reduce the local utility's market share to around 25% (Hartley).

In 1997, the nine major utilities together operated over 1,100 hydroelectric plants, 165 thermal power stations and 14 nuclear power stations. Thus, there is ample opportunity to introduce competition by having the utilities sell off most of the plants located in their home distribution areas. The neighboring utilities would not be permitted to buy the generating stations that are sold. Purchasers would instead need to be restricted to other Japanese utilities that are not currently competing with the divesting utility or else to new entrants from abroad. Licensing rules that restrict freedom of entry into generation should also be abolished, and rules for pricing transmission capacity need to be transparent. Ideally, utilities should be forced to divest of transmission and distribution businesses, possibly establishing an independent system operator to prevent discrimination (Hartley).

The desire to protect nuclear power may represent a major impediment to the implementation of world best practices in deregulation of the Japanese electricity sector.

As discussed above, nuclear plants are unlikely to be competitive in a deregulated electricity market. If the government wishes to pursue the development of nuclear power, it would most likely need to subsidize it. However, subsidies to nuclear power should not prevent deregulation of the electricity market. The government could impose a tax on electricity consumption or a carbon tax on fuels for electricity generation that could be used to pay for direct subsidies of nuclear power if that remains a priority.

As more countries succeed in restructuring their energy sector, unshackling their economies' ability to allocate resources to promote growth, Japan will have more difficult strategic choices to make in weighing potential gains in economic efficiency against long term security considerations. Postponing these choices is costly. A sound energy strategy will require a dispassionate assessment of the true likelihood of supply risks and the real costs of various government interventions.

Supply Risks: Security and Sea Lanes

There is no denying that Japan is highly vulnerable to any disruption of sea-borne shipments of oil and natural gas and must consider this fact in evaluating energy security strategies. Shipments of oil and gas can be disrupted either by an act of war or supply shocks either by accident, consumer embargo (such as economic sanctions) or oil producer policy (Horsnell). Proponents of nuclear power have long advocated that its domestic nature gives it priority over other sources of energy supply because it is more secure from international events. But nuclear power is not free from similar disruption either by accident at individual plants or by unusual event such as attack, sabotage or earthquake. Japan must consider the relative probability of supply shocks to sea-borne energy imports versus nuclear accidents and their consequences when setting energy policy priorities.

As an island nation located in a relatively unstable regional environment, Japan must also consider disruptions to oil and gas imports from hostile acts directed specifically at Japan. Despite its post-war anti-militarist orientation –codified in Article 9 of its Constitution—Japan must still concern itself with self-defense and maintenance of access to international sea lanes of communication (SLOC) that are vital to its economy.

Tokyo spends 1% of its GDP on defense annually, but still lacks the military capability to project its power into Southeast Asia, let alone the Persian Gulf.

The challenges to regional stability in Northeast Asia are real and pose direct threats to Japan's security. The division of the Korean peninsula and the contested status of Taiwan remain potential sources of outright conflict. From Japan's perspective, the possibility of war in the Koreas is of acute concern. Pyongyang's possible possession of nuclear weapons, combined with its 1998 test of a ballistic missile in Japanese airspace, raise Tokyo's stake in any war on the Korean Peninsula. This concern has been a major factor driving increased Japanese security cooperation with the United States and South Korea. Conflict over Taiwan is also a major potential source of regional instability – one, in fact, that prompted a near-crisis in 1996.

In the past, as exhibited during the Gulf War, Japanese public opinion has not supported operations abroad that would entail fighting by Japanese military personnel. Instructively, only after much debate and international criticism did Japan agree to send minesweepers to the Persian Gulf in the aftermath of the Gulf War. If conflict erupts in oil producing areas or an attempt is made to blockade Japan from receiving energy shipments, Tokyo must depend on the military power of others, particularly the U.S.

The Gulf War brought into question the foundation of Japan's defense diplomacy. A combination of perceived constitutional barriers, a reluctant public opinion and parliamentary opposition restricted Japan's support to the international coalition against Iraq. Tokyo condemned the Iraqi takeover of Kuwait and gave diplomatic approval of military action against Baghdad. However, it was only prepared to provide financial support and that was criticized for appearing to be slow in coming. Even financial aid became problematic, as the government did not believe that the Constitution would allow it to provide funds directly to the military effort. Tokyo initially sought to increase financial aid to U.S. troops in Japan as a surrogate for aiding military activities in the Gulf. Tokyo finally provided some $13 billion after heavy pressure from Washington. It did not feel that it could legally send even unarmed military personnel. These actions brought criticism from American politicians for what was termed "pocketbook diplomacy" and reconsideration in Japan of how its traditional policies would operate in a post Cold War world.

Public opinion surveys in the U.S. showed a decline in respect for Japan, and it was not invited to participate in Gulf War victory functions. Changing international and domestic conditions did allow for the dispatch of minesweepers to the Gulf after the war. Playing a role in this change were low-key reactions by Asian neighbors, the desire for Japanese business to participate in Kuwaiti reconstruction projects, a weakening of public and political opposition and a desire to placate international opinion. Yet, interviews with Japanese leaders following the conflict displayed a continued reluctance for Japan to extend its military role in the world and a general consensus that there were strong legal impediments to Tokyo doing any more than it did during the Gulf War.

Since the end of the Gulf War, Japan has walked a fine line between general support for diplomatic efforts to assure that Iraq eliminates its weapons of mass destruction while at the same time showing reluctance to back the apparent American inclination to employ military means to assure Iraqi compliance. The Iraqi crisis brought considerable discussion of the future role of Japan in the new world order. There were those who argued that the Gulf crisis showed that the U.S. could not carry on the conflict without Japanese funding, thus demonstrating Japan's international clout. Others, such as Courtney Purrington, saw this as a major watershed that would lead Japan to consider its role on the international scene. That major watershed, in fact, did not come about. But, many Japanese academics and commentators noted the need to become more independent of Washington. Some have offered the view that the interests of Japan and the U.S. differ in the Middle East. Most recently, Japan has expressed its interest in participating in Iran's upstream oil sector despite unsuccessful U.S. efforts to prevent European firms from investing there.

It is difficult to see how Japan can develop much independent leverage with regard to international crises in the Middle East. Constitutional restrictions and public opinion severely limit any military options. The effectiveness of aid as a tool of foreign policy is limited, although Middle Eastern states will continue to need industrial development. But Japan's generous development aid contributions in the past have not greatly enhanced its access to energy supplies during disruptions. The large role that Japanese firms played in the industrial development of Saudi Arabia had little effect on the kingdom's recent decision not to renew Japan's concession in oil fields in the Saudi

Neutral Zone, for example. Ultimately, while Japan can develop independent policies towards specific states of the Middle East in periods of relative peace, it must rely upon the U.S. and other powers when conflict is imminent or present.

The U.S.-Japan Alliance

The anxiety that it cannot be the master of its own fate in securing access to the free flow of energy has influenced Tokyo's energy policy choices. But fundamentally, this insecurity belies the reality of its success in the security area. Despite predictions to the contrary, the U.S.-Japan security alliance appears even stronger today than during the Cold War when the threat of a hostile Soviet Union seemingly gave the alliance an appearance of immediacy. In fact, the 1996 Clinton-Hashimoto Security Declaration ushered in an unprecedented level of U.S.-Japanese military cooperation.

The strength of the U.S.-Japan alliance should free Japan to pursue more cost-effective, market-oriented solutions to its energy conundrum. It should enable reassessment of nuclear power without fears that a hostile power could choke off its energy supplies. The idea that the U.S. might turn on Japan and cut off its oil seems extremely remote. Despite predictions to the contrary, there are no substantial signs that the relationship is weakening in any significant way. The U.S. also demonstrated its firm commitment to the security of oil flows from the Persian Gulf during the 1990 Gulf crisis.

The U.S.-Japan alliance –in the aftermath of the Cold War-- has increasingly turned to new issues that have bound the two countries together in such a tight manner that it is hard to imagine a circumstance that would bring a dramatic change. Rather than work as a simply mutual security arrangement that has lost the logic of its main threat, the relationship is one of an asymmetrical alliance in which the U.S. provides protection for Japan, and Japan in return adapts many of its policies to American liking. Japan, thus, is not "free riding" on the U.S. but contributes significantly to the relationship, using its resources to extend foreign aid to promote common goals and by contributing a decidedly non-militaristic foreign policy (Morgan, Palmer).

Ten years after the Cold War, it is perhaps even easier to see that the benefits of the alliance transcend protecting Japan from the threat of Russia and that the chances of

major changes in this relationship are minimal. The relationship between Tokyo and Washington is, to lapse into the jargon of social science, "over-determined," so decisively shaped by multiple forces that even a development of such historical proportions as the end of the Cold War cannot, in and of itself, profoundly alter it. The level of commonality of values in the U.S.-Japan alliance has created a joint stake in formal international institutions and informal international norms that promote liberal objectives ranging from greater trade and investment to protection of human rights. Japan, in essence, uses its clout –economic and otherwise—to protect and promote this orientation in the international system (Barnes).

To a great extent, the U.S.-Japanese relationship transcends purely military considerations. True, the Cold War shaped U.S.-Japanese relations in decisive ways. But so did a concerted effort, begun by Washington but embraced by most Japanese, to both create liberal domestic institutions in Japan and to imbed her in a similarly liberal international system; whatever the mixed motives of American policies during the U.S. occupation of Japan, the early years, at least, were marked by unabashedly reformist zeal. Let it be stipulated here that Japan's domestic institutions, both economic and political, diverge in important ways from Anglo-American liberal ideals. Those differences – a strongly mercantilist economic bent and an electoral system dominated for decades by a political cartel – have given birth to sharp conflicts between the two countries. But it also must be noted that the traditional institutions of a number of America's continental European allies, notably France and Germany also diverge from the Anglo-American model. A top-down approach to economic policy or a strong bias towards decision-making by consensus are not uniquely Japanese qualities – though, as noted, their particular manifestations in Japan have proven especially irksome from Washington's point of view (Barnes).

Nevertheless, Japan, the Western European democracies and the United States do share a bundle of values, which, however imperfectly held or pursued, stamp them as liberal in a way that the former Soviet Union, for instance, or contemporary China are most distinctly not. This commonality has created, over time, a joint stake in formal international institutions and informal international norms that promote liberal objectives ranging from greater trade and investment to protection of basic human rights. In the

economic realm alone, the level of integration among the major liberal democracies, including Japan, has reached levels truly unimaginable fifty years ago. This is a trend, it must be noted, that shows every sign of increasing, not decreasing, as globalization intensifies. One need not be a doctrinaire liberal – or a true believer in the thesis that democracies never go to war with each other – to understand that fifty years of cooperation have both raised the stakes of conflict and created powerful forces for conciliation. War between the United States and Japan may or may not be conceivable but it is surely imaginable only as an intellectual exercise of the most exotic, if provocative, sort (Barnes).

In addition, there is the reality – often unspoken but always implicitly understood on both sides of the Pacific – that the American security guarantee for Japan has served two purposes. The most obvious one was common defense against the Soviet threat – most famously elucidated, from the American point of view, by George Kennan, when he described Japan as a "stationary aircraft carrier" poised off Soviet Asia. But there was also another, indeed earlier objective: to ensure that Japan never again became a force for instability in the Pacific. By assuming responsibility for Japan's security, the United States helped ensure that Tokyo would not have the wherewithal to seek East Asian dominance as it had in the 1930's and 1940's. The infamous article nine of the Japanese Constitution – that constant source of irritation to US policy-makers seeking to prod Japan into a sharing a greater security burden -- was itself drafted by Japan's American occupiers. True, the objective of limiting Japan's ability to make war came into conflict with our desire to field as much force as possible against the Soviet threat. Indeed, as early as 1950, with the outbreak of the Korean War, we were secretly urging the Japanese government to embark on a significant rearmament effort. In the decades that followed, depending on the waxing and waning of the Cold War, the United States would continue to press a usually recalcitrant Japan to assume a greater defense burden (Barnes).

But that pressure stopped well short of an invitation for Japan to assume full responsibility for its own defense, much less regional security. Indeed, every perceived revival of "nationalist" sentiment in Japan continued to be greeted with concern by American observers. The benefit of restraining Japan from becoming a threat to Asia may actually have increased in importance with the end of the Cold War and the rise of

an ambitious and suspicious China on the Asian mainland. As noted, the prospect of direct US-Japanese conflict remains remote. But any major Japanese effort to rearm could nonetheless prompt a response by its neighbors – notably Beijing – with unpredictable consequences for regional stability.

Despite the end of the Cold War, Japan continues to face very real strategic dilemmas. The Northeast Asian security environment is perhaps more volatile now than during the better part of the Cold War period. In this taut post-Cold War setting, Article 5 of the security treaty that declares that the U.S. will defend Japan against any attack presumably serves to dissuade China, North Korea or any other potentially hostile regional power from considering an attack on Japan. Given the stark reality of tension among the regional powers inside Asia and the flashpoints of the Korean peninsula and Taiwan, a withdrawal into neutrality is simply not an option for Japan.

Alliance with the United States – uncomfortable as it may be – is, given the long history of the US-Japanese relationship, the option least fraught with uncertainty and importantly, the least expensive. As mentioned earlier, Japan has all the prerequisites required of a great power. Despite a decade of economic recession and political uncertainty, Japan remains immensely rich and technologically adept. Should it choose to do so, there is nothing to stop Japan from becoming a major military power with an independent nuclear deterrent and an impressive blue water navy. Even its modest military expenditures of 1% of GDP give Japan one of the largest defense budgets in the world, ranking second or third after the United States, depending on which estimate of China's defense expenditures one accepts. But the costs of any build-up would still be huge – particularly given the country's crippling current fiscal deficit and looming demographic crisis. Any effort to build up a navy capable not just of protecting major Pacific sea-lanes but of projecting force, say, into, the Persian Gulf would be simply stupendous. In other words, there is still a real material benefit – measured in hundreds of billions of dollars over the course of a decade – of continuing to free-ride on the American security guarantee. Becoming a "normal country," in short, entails prohibitive cost at least for now (Barnes).

The maintenance of the US-Japan relationship in its roughly current form also allows Tokyo to retain its unique culture of anti-militarism. It may well be that Japanese

anti-militarism is at once too naïve and too cynical – too naïve in the belief that war is somehow dispensable in what remains, after all, a dangerous world; too cynical about Japanese democracy's ability to deploy a large military establishment without risk to itself. But for now, there appears to be little urgency in Japan to put either belief to the test. At a minimum, a sharp Japanese break with the status quo would prompt huge domestic discord; at a maximum, it might embark Japan on an uncertain and perhaps dangerous strategic course. Even calls within Japan for it to become a "normal country," with their stress on increased participation in international peacekeeping, fall far short of calling for such a break; yet they nonetheless remain controversial (Barnes).

Given these realities – perhaps not immutable but surely stubborn -- there is very little reason to believe that the US-Japanese relationship will dramatically alter in the years ahead. Both Tokyo and Washington have simply too much to lose by forgoing the advantages – real, varied and mutual – of the current relationship. The level of commonality of values in the U.S.-Japan alliance has created a momentum that is unlikely to be broken up by other considerations.

In regional terms, the U.S. security relationship, by virtue of its role as a substitute for Japanese remilitarization, simultaneously discourages aggression against Japan while ensuring that Japan won't become a source of instability to the region, reassuring Japan's neighbors and possibly tempering a tendency among Northeast Asian powers towards an arms race. The alliance also improves the chances that the power of the U.S. will be connected to Asia in a predictable and stable way. Japan gains formal and regular access to security policy making within the U.S. American power is made more acceptable because it is institutionalized through bilateral alliances and regional agreements (Ikenberry, Tsyuchiyama). Finally, the alliance guarantees that the SLOCs of Japan's vital energy supplies are protected at little cost, freeing Japan to focus on other things besides aircraft carriers and frigates.

The Challenge of China?

Japan should have no doubt that the U.S. navy has the capability to ensure free flow of oil and gas supplies through the SLOCs to Japan now and for the foreseeable future. China's military power may grow over time, but so far, the rate of this growth has

been modest. It will take two or three decades before China achieves significant power projection capability. China's limited force projection capabilities give the U.S. the luxury to take a wait and see approach to containment strategy. Analysts and policy-makers advocating the aggressive containment of China need to recognize that the premature intimidation or isolation of China may prove counter-productive. It is precisely the U.S. guarantee of regional stability and equal access for all of Asia's sea-lanes that allows China to fulfill its strategic energy requirements through free riding rather than military adventurism. Any U.S.-led military efforts to seek to attenuate China's power may actually spur Beijing to adjust its current economic development focus and boost further its military expenditures.

Already, China has signaled its desire to forge a closer "alliance" with Russia to "counterbalance" U.S. power in the region. Sino-Russian energy cooperation is dedicated to enhance Sino-Russian industrial cooperation and political partnership. China is purchasing military equipment from Russia but aspirations for industrial cooperation have not yet materialized.

After the NATO bombing of Kosovo, Sino-Russian political closeness became more important to Beijing. On August 25^{th,} 1999, before taking part in a five-nation summit in Kyrgyzstan, Chinese President Jiang Zemin met Russian President Boris Yeltsin. The two leaders signaled their desire to forge a closer alliance to counterbalance U.S. global power. In December 1999, Yeltsin and Jiang met again on security issues in Beijing prior to President Yeltsin's resignation. Industrial and military cooperation is planned as the core component of the alliance. So far, a dozen agreements have been signed as part of this alliance, including Russian gas export deals to China, high technology and military cooperation and forestry development ventures (Xu).

Russia has placed conditions on its energy cooperation with China while China is facing competition and other uncertainties such as the economic weakness and political uncertainties in Russia and the Russian Far East. So far, a Sino-Russian strategic partnership has been limited to political intent and diplomatic events rather than actual industrial cooperation. Energy cooperation is intended to be a key component of the new Sino-Russian alliance. But China has not yet made a commitment and is waiting to assess availability of resources and feasible options of the gas transportation from either

Russia or elsewhere. As China and Russia move into closer political cooperation, the U.S. and Japan will have to carefully deal with major potential conflicts in the region including the problem of the Korean Peninsula, military confrontation and territorial disputes. (Xu).

China ended the 1980s with only modest power projection capability. But during the 1990s, it significantly improved the quantity and quality of its missile capability and is now seeing the benefits of force modernization. China is increasing its ability to deliver nuclear weapons intercontinental distances and to land troops through amphibious assault (although no more than one division at a time). The surface component of the navy is also expanding. While the Chinese air force currently possesses a small number of modern aircraft, it is adding the kinds of aircraft and capabilities necessary to project power, including new Russian Sovremenny-class destroyers, anti-ship missiles and SU27 airplanes (see Stoll).

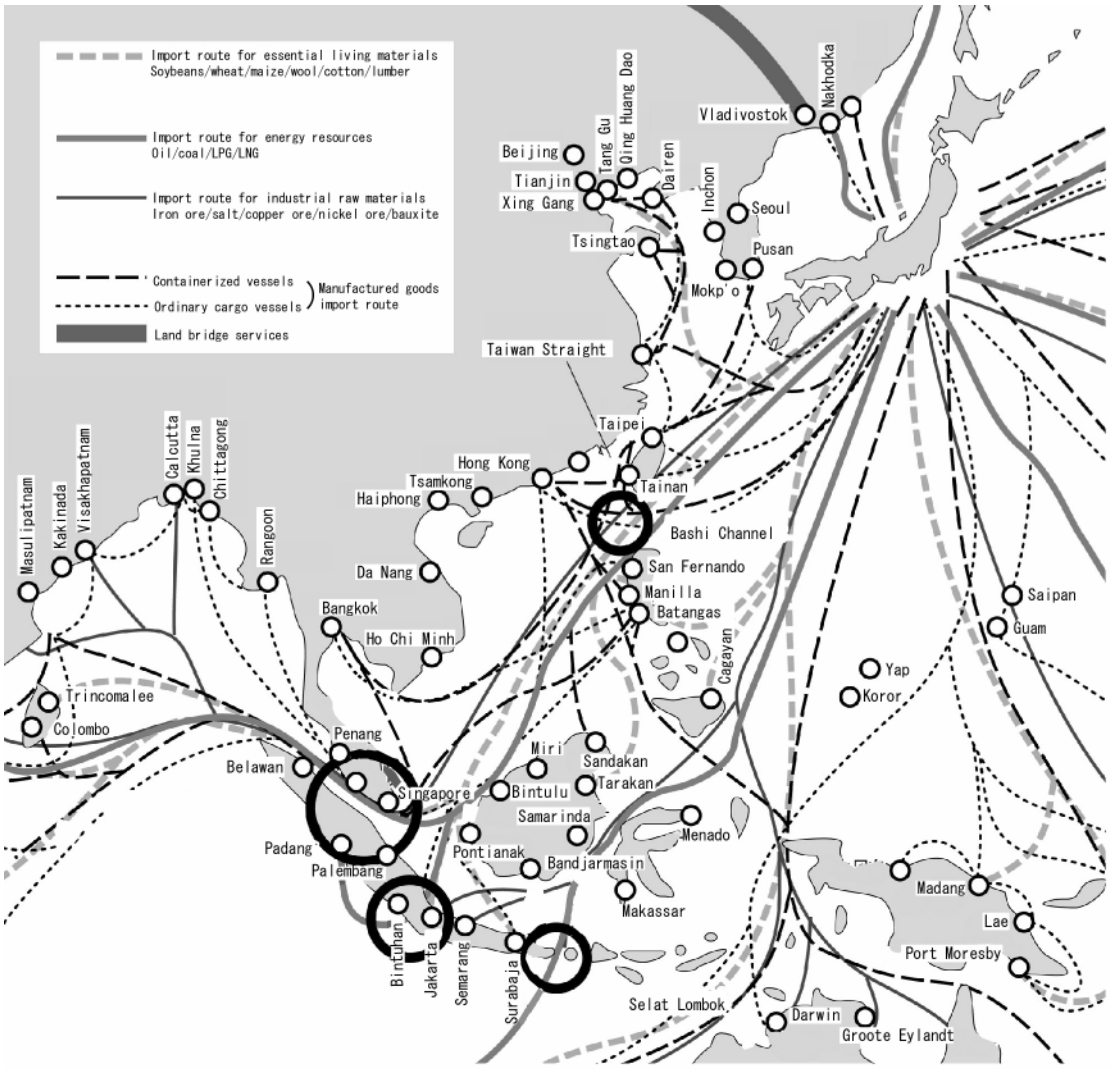
China has improved its military position vis-à-vis India and Japan but it still does not currently have the military capability to operate its navy at great distances from land. Thus, China lacks the ability to close major sea-lanes in Asian waters for any prolonged period of time. In fact, China would need to increase its power projection much more significantly to pose a threat to the region. The historical record of naval competitions since 1816 suggest that an increase in power projection by China would be of concern only if China surpasses the other regional powers in power projection capability. This only seems likely if the other significant military powers in the region stand still and even then, an across the board power projection edge would take China years to develop (Stoll). Another danger to the region is the possibility that active regional rivalries (India-Pakistan, India-China, North Korea-South Korea, North Korea-Japan, and Japan-China) could create a series of regional arms competitions that could escalate, raising the risks of conflict. The United States should avoid at all costs an American drawdown in the Pacific, which might open space for security competition among Asian regional rivals to fill the vacuum. Such a vacuum would be far more dangerous to Asian stability than the potential for a Chinese challenge to the status quo.

Hard To Close Asian Sea Lanes

Still, even in the very unlikely scenario that the U.S. were to shirk its responsibilities under the alliance to defend Asian SLOCs leading to Japan, it would be exceedingly difficult for a hostile power to shut off all access to the country. There are several choke points in Asian waters including the Strait of Malacca, the Spratly Islands and the Bashi Channel. Most of the countries of Northeast and Southeast Asia rely predominantly on the Strait of Malacca for the carriage of energy resources, manufactured products, and other commodities. As the economic activity and oil imports to the region increase, the risk of accident in this SLOC will increase as well.

Japan, Korea, China, Taiwan, and the Phillippines use the sea-lanes off the Spratly Islands, and Japan and South Korea utilize sea-lanes beyond the Bashi Channel. China uses the sea-lane of the Taiwan Strait to reach its northeast regions where there is a concentration of strategic industries. Therefore, it is clear that China must consider carefully any strategy to block a critical passageway since its own vital shipments of energy and other products would also be affected.

Chart 1: Sea Lane Carriage and Choke Points in Asia



Despite the high stakes, the possibility remains that territorial disputes and heightened nationalist sentiment could cause a conflict in the Spratly Islands region that could be detrimental to the free flow of oil around the area. Any closure of passageways through the Spratly's would affect oil shipments to the Philippines, China, Taiwan, Japan, and Korea and also adversely affect trade within Southeast Asia. The territory around these islands is claimed by six nations - China, Taiwan, Vietnam, the Philippines, Malaysia, and Brunei, and occasional flare-ups over territorial issues have taken place in recent years. China and Vietnam skirmished over the Spratly Islands in 1988. While this area has not seen any major direct-armed conflicts since, it remains an area of potential conflict (Hashimoto).

China unilaterally declared the Spratly Islands as a legal part of its territory in 1992. Strong protests came from the other nations concerned, and a declaration toward restraint was made during the ASEAN ministers' meeting that same year. In 1995, China constructed a small building on the Spratly Island's Mischief Atoll whose territory is claimed by the Philippines. Between 1998 and 1999, China added an extension to its building on Mischief Atoll, increasing the tension between the two nations. In 1999, Malaysia, as one of the nations concerned, chose to expand its existing facilities on the Investigator Atoll that is claimed by the Philippines, again raising the stakes. While these incidents have fallen short of precipitating a disruption to shipping, the risk of escalation remains. Therefore, it is advisable to increase preventive diplomacy surrounding the territorial conflict over the Spratly Islands to ensure safe and stable passage of international shipping in the area (Hashimoto).

Although the risks to clear passage in the important Strait of Malacca and Spratly Islands exist, there remain several ways to bypass these routes. Both the Sunda and Lombok Straits, which are now used infrequently, can serve as an alternative to the Strait of Malacca. Japan could also use the Lombok Strait to bypass the Bashi channel were the waters around Taiwan affected by a conflict with the People's Republic of China or at higher expense, it could bring its shipments around Australia, bypassing the South China Sea altogether. In the event of such a conflict, South Korea would be forced to use the Tsugaru channel in Northern Japan to facilitate oil deliveries (Hashimoto).

Multilateral Energy Security Frameworks

The fact that Japan has alternative routes to bypass the Strait of Malacca and other choke points should give Tokyo a more relaxed approach to the prospects of rising import levels. Still, as Japanese, South Korean and Chinese energy imports grow, the risk of accident in vital Asian sea-lanes will increase, particularly for the heavily trafficked Strait of Malacca, possibly raising tanker insurance rates. Moreover, this area is plagued with a growing problem of piracy that endangers the stable shipment of energy to at least a dozen countries in the region. Therefore, Japan and its neighbors would benefit from establishing a multilateral safety commission that could serve as a forum for ensuring the

security and environmental protection of these key waterways. Such an institution, through the thoughtful mediation of trusted regional players, such as Singapore or Indonesia, could play an important role in discussing and resolving multinational issues such as territorial disputes and the control of piracy.

Besides establishing institutions that will help reduce the risks to Asia's waterways, Asian countries can use oil stockpiles to minimize the negative impact of a disruption. The experience of the OECD industrialized countries in the 1970s and during the 1990 Gulf crisis has demonstrated the benefit of a jointly held emergency oil stockpiling system. An awareness is developing in Asia that Asian countries will come to share the same energy supply sources, the same risks, and the same SLOCs in the years ahead. This awareness, if cultivated, could serve as the basis for the creation of an Asian stockpiling system that could serve to lower tensions in the region.

Storage in Thailand could provide emergency supplies to Myanmar, Cambodia, the Malay Peninsula, Singapore, and Vietnam. Another possibility is for Brunei, Indonesia, and Malaysia to build up a small stockpile to use in the case of disruptions to Asia. Japan, South Korea, and Taiwan may choose to utilize storage at Okinawa. To implement such a plan, a legal framework must be created in Japan to make stored oil available to the market. Initially, it might be more practical to begin with limited measures such as establishing energy resources lending programs such as an Asian oil stockpiling mechanism where members hold 30 to 40 days worth of supply, and rules for oil drawing rights and long-term repayment are established (Hashimoto).

The creation of a multinational agency to examine the issue of energy security for the entire Asian region also makes sense. An Asian Energy Agency (AEA) could promote and supervise joint oil storage and several other functions relating to energy security in Asia. Just as the IEA was created to deal with OPEC, it is advisable that Asian countries, which must maintain long-term stable relations with the Gulf oil-producing states in years to come, create a multinational organization that represents their interests and enhances their bargaining power. An AEA can also function as a forum for comprehensive discussion of nuclear energy issues including managing fuel cycles and identifying storage for nuclear waste (Hashimoto).

Institution building around energy issues could create a larger sense of shared interests and foster both the formal structures and institutional norms that could lead to broader cooperation in Asia. Even limited cooperation –if successful—can facilitate a network of personal ties and an ethos of consultation among traditionally suspicious governments. The U.S. could play a pivotal role in this regard. It is currently exploring ways of establishing a dialogue –modeled on the Conference on Security and Cooperation in Europe—between the wider set of states in the region and should take an active role in engaging China in the process. Yet, movement to a European-style community-based security system would be premature. The multinational security system in Europe emerged out of centuries of balance of power politics that socialized states and created the common values and conditions for strong institutionalized multilateralism. By contrast, there is a notable absence of a strong sense of shared identity and culture in Asia, and several countries, including Japan are predisposed toward bilateralism. The evolution of shared norms and linked systems in Asia is still at an early stage (Ikenberry, Tsyuchiyama).

Cultural and Historical Influences on Northeast Asian Energy Cooperation

Current trends in Asia – above all, the ongoing globalization of regional economies and deregulation of the energy sectors – are increasing the incentives for cooperation and raising the costs of conflict for importing countries. Indeed, it is becoming clear to all the countries of the region that there are significant benefits to be reaped –both economically and strategically- from cooperating on energy policy.

Despite the apparent economic and strategic desirability of energy cooperation, cultural, historical and political barriers will have to be overcome. Northeast Asia is a region burdened with a troubled and often violent history. Japanese mistrust of Russia was reinforced on many counts: by Russia's late entry into the Pacific war, despite the neutrality treaty with Japan; by its occupation of four Kurile Islands; and by the harsh treatment of Japanese prisoners-of-war in the postwar era. Although Japan and the former Soviet Union signed the Declaration of Cease-fire in 1956, they have not been able to conclude a peace treaty to date. Both nations are in an unprecedented legal status - they are neither at war nor at peace (Mito).

By the same token, the brutal Japanese occupation of Manchuria in the 1930s and 40s remains an open wound in Sino-Japanese relations. This was demonstrated dramatically in July 1996 in the aftermath of Prime Minister Ryutaro Hashimoto's official visit to the Yasakuni shrine, the burial for Japan's war dead. The incident, taken together with a Japanese nationalist group's plans to build a lighthouse on the Senkaku Islands, prompted a frenzied response in the Chinese press, warning of the perils of resurging Japanese militarism. Even Taiwan and Hong Kong saw protests against Japanese activities in the islands. Although the islands are not strategically valuable, Chinese leaders and foreign policy analysts view the official silence in Tokyo as encouragement of an unofficial policy of expansion. The timing was particularly bad for fostering trust in trilateral relations between Japan, the U.S. and China. Chinese leaders and analysts at the time were deeply suspicious of Japan and concerned that the U.S.-Japan Security treaty is being redefined in a way that will allow for Japanese militarism and even involvement in potential Taiwanese independence. The dispute over the Senkaku Islands was thus an important symbol for masses and elite alike in Taiwan, Hong Kong and Mainland China (see Seminar Paper).

Since the end of the Cold War, Japanese leaders have offered a series of apologies acknowledging Japanese responsibility for the war, beginning with Emperor Akihito's historic trip to the People's Republic of China in 1992 and continuing with a series of statements by Japanese leaders since then. But the validity of the war crimes accusations and Japanese responsibility continue to be contested in Japanese discourse, and prominent Japanese individuals continue to voice unrepentant views of the war. This

unfortunate by-product of democracy continues to fuel historically rooted animosity between Japan and China since Japan's seeming unwillingness to offer what the Chinese view as a sincere apology for such atrocities as the rape of Nanjing infuriates ordinary Chinese citizens and raises the suspicion that the Japanese have learned nothing from the past. Indeed, many Chinese feel that Japan's professed commitment to pacifism is nothing more than a sham.

For their part, the Japanese see China's unwillingness to accept the apologies that have been offered as evidence that reconciliation is impossible. Many Japanese believe that the PRC leadership tries to misuse history to cynically extract concessions on Taiwan and other issues. These deeply rooted animosities exacerbate the danger of great power competition in Asia. In particular, the gap in perceptions of history between the two chief powers in the region, China and Japan, serves to reinforce the suspicions that each holds for the other.

Japan's long and brutal colonial history in Korea, extending from 1910-1945, also negatively influences the relations between Tokyo and Seoul today despite their close security relations with the United States and the growing compatibility of economic interests. As recently as 1997, when both nations were facing deep concerns about the potential nuclear status of North Korea, a verbal firestorm erupted between Japan and South Korea over the status of the Takeshima/Tokdo islands in the Sea of Japan.

Japan's official apology for the tragedies of the colonial period --extended during the Kim Due-Jung/Obuchi summit in 1998-- was considered a successful effort to create a new diplomatic atmosphere between the two countries, and indeed, relations between the two countries have improved significantly in the last two years. Although Japanese leaders had offered similar statements in 1983 and again in 1990, the 1998 apology was unique in that it was the first time a reference to the past Colonial period was incorporated into the formal communiqué of a bilateral summit, lending a stronger air of formality and importance. However, on the level of popular opinion, even the 1998 statement was seen as lacking because it failed to cover more specifically the issue of war crimes and atrocities, particularly the "comfort women" system imposed by Japan. South Korean Comfort women organizations continue to stage weekly protests in front of the Japanese Embassy in Seoul. The bitterness that remains under the surface within the

South Korean polity hinders the efforts of South Korean and American officials to strengthen ties between Seoul and Tokyo (see Seminar Paper).

Over the last decade, both Russia and China have substantially improved relations with South Korea. However, these improved ties come against a backdrop of the history of conflict on the Korean peninsula when both Beijing and Moscow supported North Korea in its efforts to conquer the South in the early days of the Cold War.

Finally, Sino-Russian relations have been similarly uneasy despite converging political and economic systems during the rise of communism in both countries. The improvement in U.S.-China relations in the 1970s, culminating in President Nixon's visit to Beijing in 1972, was driven by recognition inside China that that its former ally, the Soviet Union, constituted the main threat to its security in the aftermath of the 1969 border clashes between the Soviets and the Chinese. The difficulties between the two countries in the 1960s and 1970s came against a backdrop of bitter memories of the bloody invasion of Manchuria by the Russian Red Army in 1945. More recently, in response to U.S. and NATO intervention in Kosovo, Beijing tried to create a rapprochement with Moscow to "counter" U.S. hegemony and interference in "internal affairs of sovereign nations," but such efforts have yet to establish credible cooperation beyond improved Chinese access to Russian weapons sales.

Compounding historical enmities, all four major countries of the region – China, Japan, South Korea and Russia – possess a profound sense of national vulnerability. China remains deeply aware of the humiliation it endured at the hands of foreigners – first Westerners, then Japanese – in the century leading up to the Communist seizure of power in 1949. Japan, for its part, still remembers World War II and its aftermath – years that brought home, with death and devastation, its vulnerability to economic isolation and military defeat. Russian history is replete with war-related suffering and invasion. Finally, Korea has, throughout much of its history, existed as a buffer state between great powers – China, Russia, Japan, and the United States – with all the anxiety that such an exposed situation implies. Mutual suspicion is deep-seated and pervasive.

Moreover, all four countries are – or will be – in periods of domestic transition. China and Russia confront not only the monumental task of finishing economic revolution but of somehow developing a political system that will mesh with their new

economies. Japan has barely embarked on the major economic reforms required to return it to the path of sustained, robust growth – reforms with potentially huge political and social ramifications. South Korea faces, sooner or later, the enormous human and financial dislocations that will inevitably be associated with reunification with the North.

The end of the Cold War and the rise of China complicate even further the geostrategic environment of Northeast Asia. China's posture will decisively shape that environment in the years ahead. Should China assume a confrontational posture, the region could see a sharp deterioration in stability, undermining chances for cooperation on energy issues.

Inside China, international relations are analyzed from the perspective of trends in the balance of "comprehensive national power"—that is, economic, technological, political, and cultural as well as military power. In the aftermath of the Cold War era, Chinese leaders expected the world to evolve rapidly away from the collapsed bipolar structure toward increasing multi-polarity. They predicted that U.S. comprehensive national power would decline relative to the rising power of the other major "poles"—Japan, Europe, Russia and especially China. Multilateral institutions such as the United Nations were expected to play an increasingly important role in maintaining international security, while U.S. alliances with Japan and Europe were judged to be Cold War relics that would gradually fade away. The other poles of the multi-polar world would become not only stronger, the Chinese anticipated, but also increasingly independent and willing to challenge the United States.

In this environment, China expected U.S. tendencies toward "hegemonism" and "interference in the internal affairs of other states" to be checked by the international system, potentially enhancing China's position in the world as a rising economic power. An increasing focus on economic development as the path to enhancing national power and status within the international community was thought to be a major benefit for China's ultimate position because of its rising economic muscle.

Chinese optimism about its internal and external environment has been eroding over the last several years, however, as the U.S. lead over all the other poles has widened, not narrowed, and the expected multi-polar world has failed to emerge. Based on a very static and mechanical analysis of U.S. foreign policy motivations, many of China's

leaders, especially the military elite and analysts, advocate hard-line measures and aggressive reactions as the only rational response (see Seminar paper).

China's leaders are also likely to adopt more nationalistic policies as they become more sensitive to popular perceptions and attitudes. Surveys of China's youth reveal strong nationalistic views, particularly toward the United States. These views are a "double-edged sword" for Chinese leaders, however, as they also come with unrealistic expectations about China's military strength and ability to assert itself in the international arena.[2] Chinese leaders are both aware of these nationalistic popular perceptions and particularly sensitive to them. Contrary to the common wisdom about the isolated nature of decision-making in authoritarian political systems, Chinese leaders regularly commission sophisticated polls and surveys of popular views on foreign affairs.[3] And Chinese leaders in the post-Cultural Revolution era have been especially mindful of the potential dangers of student and youth protests. Hu Yaobang and Zhao Ziyang were both forced to step down as Party General Secretaries in response to politics set in motion by student protests (Seminar Paper).

In the context of these internal pressures on Chinese leaders and the unanticipated strength of the U.S. within the international community, the intractable and volatile problem of the status of Taiwan has increasingly come to trouble China's leaders. Former President Lee Teng-hui's perceived push toward independence, and the election of Chen Shui-bian of the pro-independence Democratic Progressive Party (DPP) as his successor, will likely remain a thorn in the side of China's weakened regime for some time to come. Although Chen has called for pragmatic negotiations with the Mainland, and even publicly asked the U.S. to normalize trade relations and support China's accession to the WTO, Beijing's leaders were both surprised by his election and unprepared to deal with a leader they have vilified. Chinese foreign policy experts suspect that the KMT and DPP are secretly working together to achieve independence

[2] Transnational China Project, 2000, "Chinese Values and Attitudes in the Era of Economic Reform: The State of the Art in Polling and Survey Research in China," executive summary of a workshop at the Baker Institute, Rice University, March 2000, and especially a paper presented at the workshop, Stanley Rosen, 2000, "Chinese Youth in the Year 2000: Internationalization, Nationalism and Pragmatism."
[3] Transnational China Op Cit

rather than perceive the more complicated set of domestic issues that swept Chen into power.

The U.S. historic role in this conflict is also resented and suspect in the eyes of Beijing's leaders. China's response to Lee's "provocative" visit to the United States in June 1995 led to the Sino-U.S. confrontation over Chinese missile tests near Taiwan in March 1996. Behind the scenes, Jiang Zemin and Vice-Premier Qian Qichen reportedly faced strong criticism from hardliners and the military over their failure to persuade the U.S. to honor its commitment to deny Lee a visit. The result was the adoption of confrontational policies, including the missile tests.

Nevertheless, Beijing and Washington successfully turned the danger of the crisis into an opportunity to improve relations, leading to two summits in 1997 and 1998 and a declaration that the two sides were "building toward a constructive strategic partnership." But the underlying problems in Sino-American relations (including human rights, trade disputes, proliferation, and, most of all, Taiwan) have not been resolved. Deepening suspicions of each other's strategic intentions—especially within the broader body politics of both countries—were neither addressed nor ameliorated. At the same time, NATO's U.S.-led intervention in Kosovo spurred widespread questioning inside China of Deng Xiaoping's dictum that the current era was one of "peace and development" and that world war was not inevitable. This belief was critical to China's decision to place top priority on economic development and place defense on the bottom of its lists of "Four Modernizations."

In this context, the US bilateral security relationships with South Korea and Japan take on a more threatening face to Beijing, particularly in relation to the complex issue of Taiwan. The question is not so much whether the Chinese policy and opinion makers would like to drive the U.S. out of Asia as concerns that the U.S. will use its security partnerships to cater to a Taiwan that wants to change the status quo by becoming a *de jure* independent nation.

Concerns have emerged in Chinese security circles in recent years about a perceived broadening of the scope of the U.S.-Japan alliance to encompass the Taiwan Strait. To the extent that U.S. alliances and military forces are perceived to pose a threat of intervention in a Taiwan conflict—or provide peacetime psychological and political

support to Taiwan independence forces—they pose a threat to China. In contrast, as long as the American presence is viewed as restraining Japan from pursuing an independent military capability and nuclear weapons and maintaining stability on the Korean Peninsula, it will be seen as contributing to regional stability. But concern about U.S. intentions regarding Taiwan and broader U.S. strategic intentions toward China are weakening support for this latter view. The Chinese are especially concerned that the United States will provide Taiwan with theater missile defense (TMD) that will encourage independence forces and re-establish the U.S.-Taiwan defense treaty on a de facto basis. They also worry that the United States will deploy a national missile defense that will neutralize China's nuclear deterrent force and undermine the strategic status quo.

Despite rising nationalism in China and the objections of hardliners, China's leadership is still pursuing improved relations with the U.S. China appears to be content to rise as a civilian great power in the American, capitalist-led world order for the foreseeable future if U.S. choices in the region favor status quo politics. Chinese leaders see their overriding national interest in economic development, which they recognize requires good relations with the U.S. This more interdependent inclination, should it last, leaves open the possibility for cooperation on energy and other matters.

Regardless of these differences, neither the U.S. nor China appears to have hostile strategic intentions toward the other. The United States and China are not engaged in a life or death struggle between communism and capitalism. Rather, both sides have a compelling national interest in maintaining a pragmatic cooperative relationship. It is from this base of common interest in cooperation that China can be urged to participate in multi-lateral activities in Asia.

Northeast Asia is perhaps decades away from having the established institutions and shared values of the European community. Moreover, great distances and difficult terrain separate the countries of Northeast Asia, rendering the costs of cooperation on energy infrastructure to exorbitant levels. Still, the occasional array of summitry demonstrates the underlying interest in improving regional relations, despite historical enmities, and the clear strategic benefits that can ensue from cooperation in key areas like energy. Perhaps nowhere in the world except Northeast Asia do concerns about resource scarcity and the imperatives of self-reliance resonate with more vigor. With this common

concern, the possibility for energy cooperation seems promising. However, for the foreseeable future given the geopolitical backdrop of Northeast Asia, energy cooperation will have to occur in an atmosphere of mutual suspicion, domestic transition and geostrategic uncertainty. Still, energy has the potential to serve as an integrative force. By virtue of the strategic importance of energy, a gesture to voluntarily link one's energy fate to others is a form of interdependence that requires and thereby creates trust and confidence.

Policy Recommendations

1) The United States should avoid at all costs a U.S. military drawdown in the Pacific, which might open space for security competition –for example, between China and Japan—to fill the vacuum. Such a vacuum would be far more dangerous to Asian stability than the potential for a Chinese challenge to the status quo.
2) Japan and the United States should carefully consider any significant alteration of the current level of security cooperation. Advantage will not be gained by pressing policies that will result in a divisive domestic reaction in Japan or a sharp destabilizing response from Beijing. China's limited force projection capabilities give the U.S. the luxury to take a wait and see approach towards containment strategy for China. The U.S. should also avoid fueling tendencies toward enmity and paranoia in Northeast Asia by pushing programs that will be perceived as untenable direct security threats against China and North Korea unless circumstances clearly warrant them.
3) Japanese policy makers should judge the future of nuclear energy in Japan dispassionately on an economic and environmental basis rather than on supply security grounds. More research and development should be made in developing safer use of nuclear facilities.
4) Japan should focus on the restructuring of its natural gas industry to facilitate expansion of natural gas import options as a means to diversify its energy mix. To promote higher natural gas imports, Japan must resolve issues blocking

construction of a national transmission grid. Cost-effective natural gas imports from the Sakhalin Islands should be given priority.

5) The Japanese government should increase its support for research and development of alternative energy technologies in an effort to limit the monopoly power of OPEC.
6) The Japanese government should embrace more ardently the shift from administrative, direct government intervention in its energy sector to more market conforming, arms length government regulation. Regulation should focus primarily on environmental protection and stockpiling and other emergency supply measures.
7) The Japanese government should reconsider its current proposals for partial deregulation of electricity market, reexamine its options and adopt a new reform program that will best fit its own circumstances to international best practices. Among policy goals should be to upgrade links between utilities to carry more power, to break up generating monopolies by requiring substantial divestitures, and to establish access-pricing rules determined by an independent agency to promote competition in distribution. Controls on retail prices should only be relaxed after the wholesale electricity market has become more competitive to protect consumer interests.
8) The U.S. should rethink its approach towards multilateralism in Asia, focusing efforts on problem solving-based institution building versus process-based groupings. It should also consider more carefully when it must participate as an active member in Asian institutions. Participation in and organization of Asian-oriented joint energy institutions is an attractive means for Japan to build ties in the region independent of U.S. initiatives.
9) China should continue to share the use of sea-lanes peacefully with its neighbors and refrain from pursuing its own gradually increasing naval projection power.
10) To ensure energy security, Asian nations, together with the U.S., should develop an environment that would enable China to meet its energy needs and be engaged in a multinational framework, thereby removing the sense of

isolation China may feel. At the same time, it is necessary to continue in persuading China that uncooperative energy policies would work against its own best interest.

11) Asian regional forums should make greater efforts to initiate preventive diplomacy surrounding the territorial conflict over the Spratly Islands to ensure safe and stable passage of international shipping in the area.
12) A multinational Asian Energy Agency (AEA) should be created to coordinate Asian energy policies, including joint emergency stockpiling of oil. Options for locating joint oil storage should be investigated including Thailand, Brunei, and Indonesia.
13) The multinational AEA should also function as a forum for comprehensive discussion of nuclear energy issues including managing fuel cycles and identifying storage for nuclear waste.
14) A multinational Asian Maritime Safety Commission should be created to serve as a forum for solving territorial disputes, controlling piracy, and ensuring joint environmental protection of vital waterways in Asia.

Appendix

PROJECTED OIL REQUIREMENTS (SCENARIO 1)

	HISTORICAL 1995	PROJECTED 2015		
		1.5%	2.5%	3.5%
RESIDENTIAL AND COMMERCIAL				
MILLION METRIC TONS	**38.078**	**79.616**	**82.295**	**84.286**
INCREASE OF		***41.516***	***44.195***	***46.186***
MILLION BARRELS PER DAY	**0.759**	**1.588**	**1.641**	**1.681**
INCREASE OF		***0.829***	***0.882***	***0.922***
TRANSPORTATION				
MILLION METRIC TONS	**83.361**	**127.326**	**141.232**	**155.694**
INCREASE OF		***43.926***	***57.832***	***72.294***
MILLION BARRELS PER DAY	**1.663**	**2.540**	**2.817**	**3.105**
INCREASE OF		***0.877***	***1.154***	***1.442***
INDUSTRIAL AND OTHER				
MILLION METRIC TONS	**102.369**	**106.330**	**104.432**	**101.425**
INCREASE OF		***3.930***	***2.032***	***-0.975***
MILLION BARRELS PER DAY	**2.042**	**2.121**	**2.083**	**2.023**
INCREASE OF		***0.079***	***0.041***	***-0.019***
TOTAL FINAL				
MILLION METRIC TONS	**223.807**	**313.272**	**327.959**	**341.405**
INCREASE OF		***89.472***	***104.159***	***117.605***
MILLION BARRELS PER DAY	**4.464**	**6.248**	**6.541**	**6.809**
INCREASE OF		***1.784***	***2.077***	***2.345***
TOTAL PRIMARY				
MILLION METRIC TONS	**272.935**	**382.039**	**399.951**	**416.347**
INCREASE OF		***109.104***	***127.016***	***143.412***
MILLION BARRELS PER DAY	**5.444**	**7.620**	**7.977**	**8.304**
INCREASE OF		***2.176***	***2.533***	***2.860***

NOTES:

(A) CONVERSION USED FOR TONS TO BARRELS IS 7.33 BARRELS/TON

(b) Oil losses from transformation were approximately 22% of primary requirement in 1995. We assume this value to obtain primary requirement.

PROJECTED OIL REQUIREMENTS (SCENARIO 2)

	HISTORICAL 1995	PROJECTED 2015		
		1.5%	2.5%	3.5%
RESIDENTIAL AND COMMERCIAL				
MILLION METRIC TONS	**38.078**	**57.663**	**59.604**	**61.046**
INCREASE OF		***19.563***	***21.504***	***22.946***
MILLION BARRELS PER DAY	**0.759**	**1.150**	**1.189**	**1.218**
INCREASE OF		***0.391***	***0.430***	***0.459***
TRANSPORTATION				
MILLION METRIC TONS	**83.361**	**127.326**	**141.232**	**155.694**
INCREASE OF		***43.926***	***57.832***	***72.294***
MILLION BARRELS PER DAY	**1.663**	**2.540**	**2.817**	**3.105**
INCREASE OF		***0.877***	***1.154***	***1.442***
INDUSTRIAL AND OTHER				
MILLION METRIC TONS	**102.369**	**77.012**	**75.637**	**73.459**
INCREASE OF		***-25.388***	***-26.763***	***-28.941***
MILLION BARRELS PER DAY	**2.042**	**1.536**	**1.509**	**1.465**
INCREASE OF		***-0.506***	***-0.533***	***-0.577***
TOTAL FINAL				
MILLION METRIC TONS	**223.807**	**262.002**	**276.473**	**290.199**
INCREASE OF		***38.202***	***52.673***	***66.399***
MILLION BARRELS PER DAY	**4.464**	**5.226**	**5.514**	**5.788**
INCREASE OF		***0.762***	***1.050***	***1.324***
TOTAL PRIMARY				
MILLION METRIC TONS	**272.935**	**319.514**	**337.163**	**353.901**
INCREASE OF		***46.591***	***64.240***	***80.978***
MILLION BARRELS PER DAY	**5.444**	**6.373**	**6.725**	**7.059**
INCREASE OF		***0.929***	***1.281***	***1.615***

Fig.3 Power Generation Costs based on Financial Statements

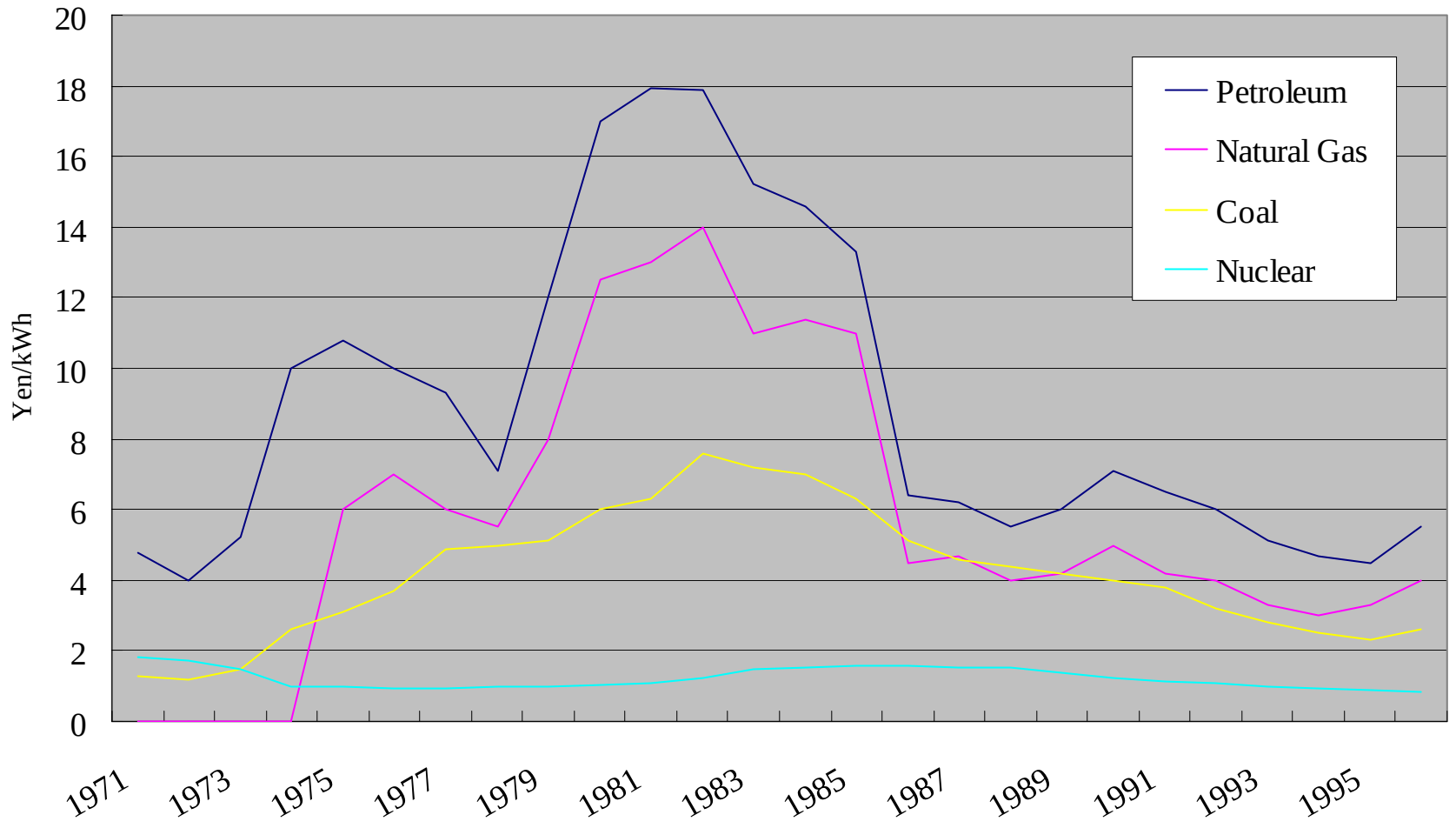


Fig.4 Nuclear Power Generation Cost
(up to year 2010)

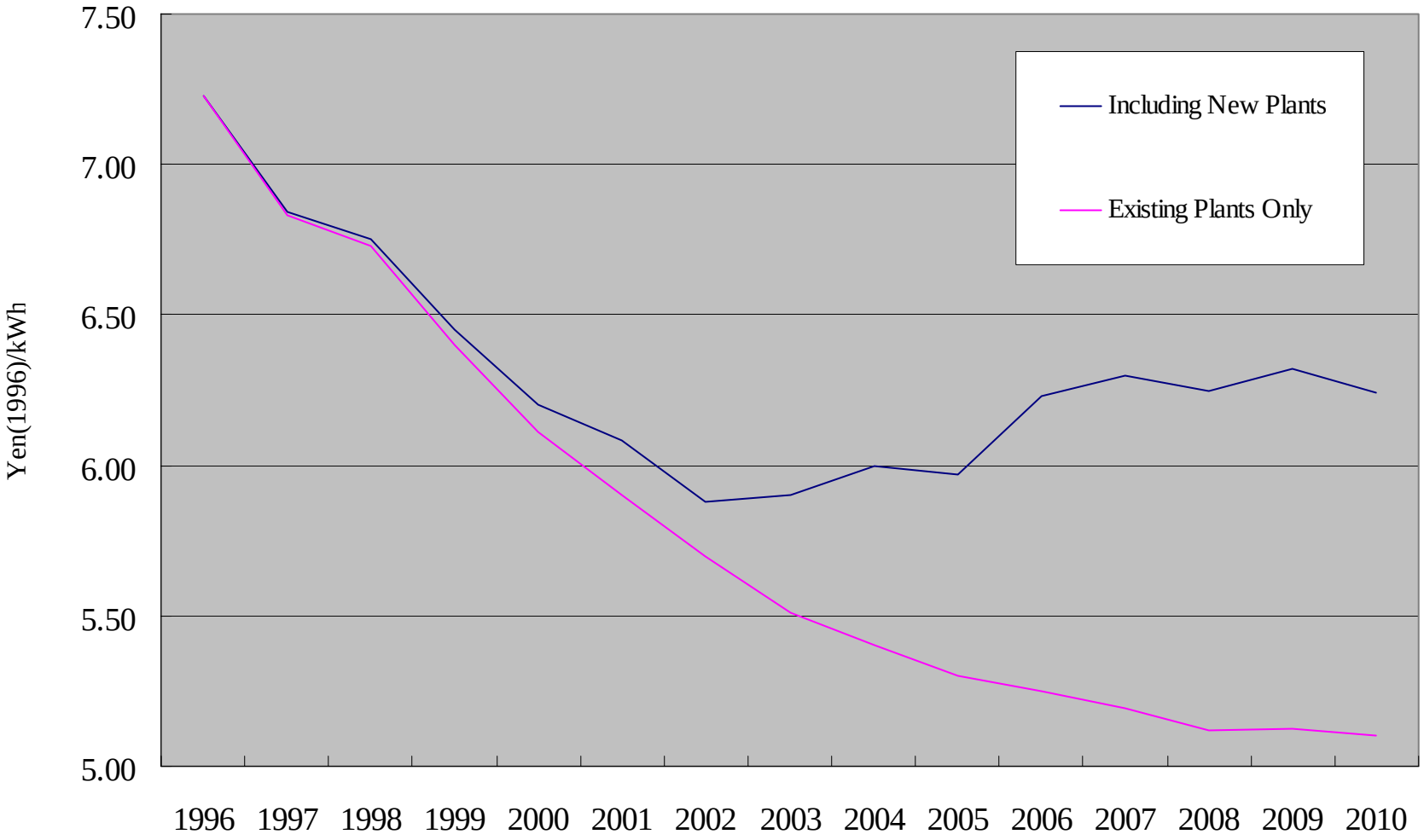
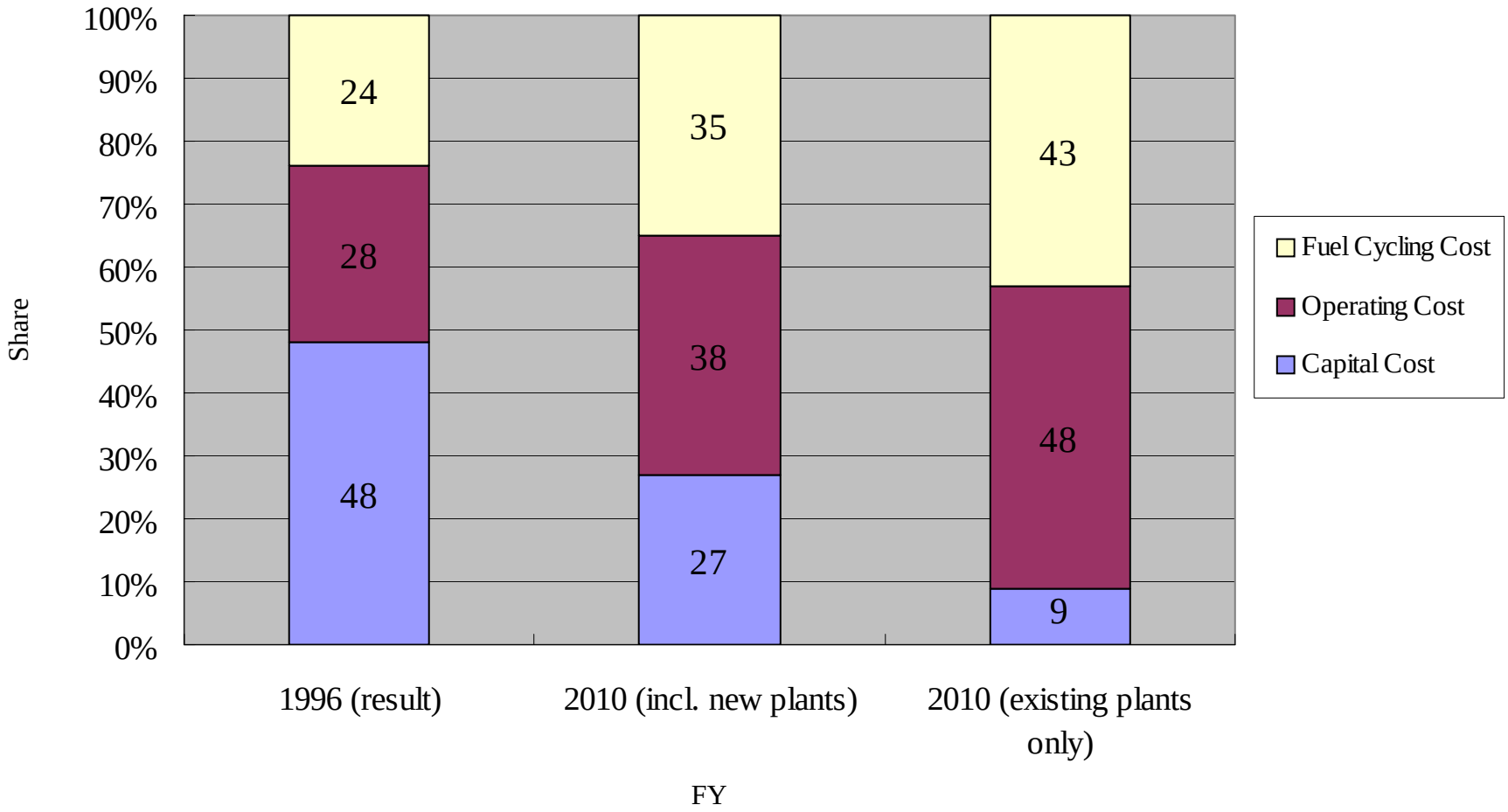
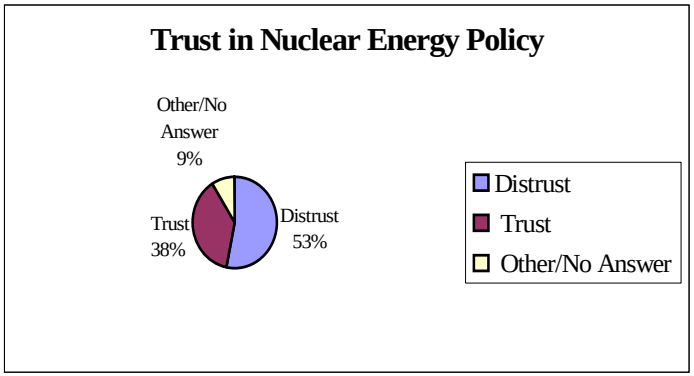
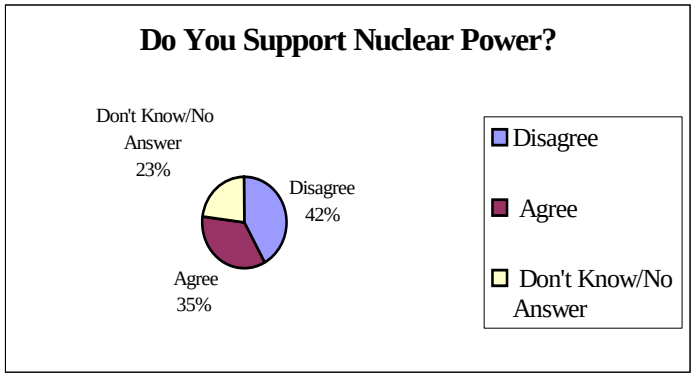


Fig.5 Cost Structure of Nuclear Power Generation
(Outlook for year 2010)



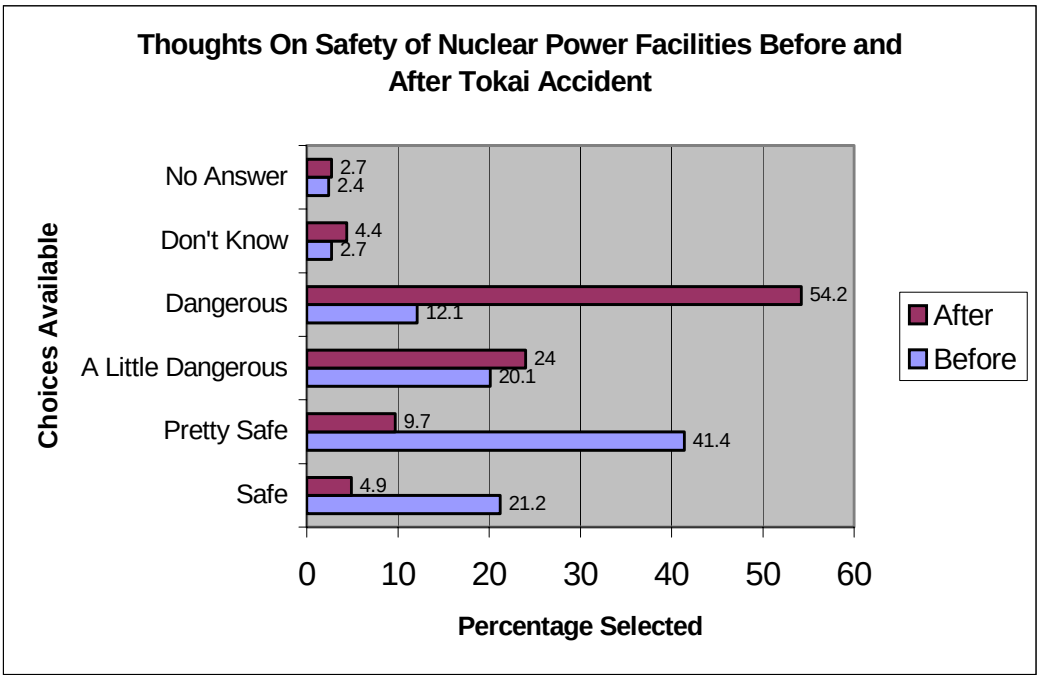




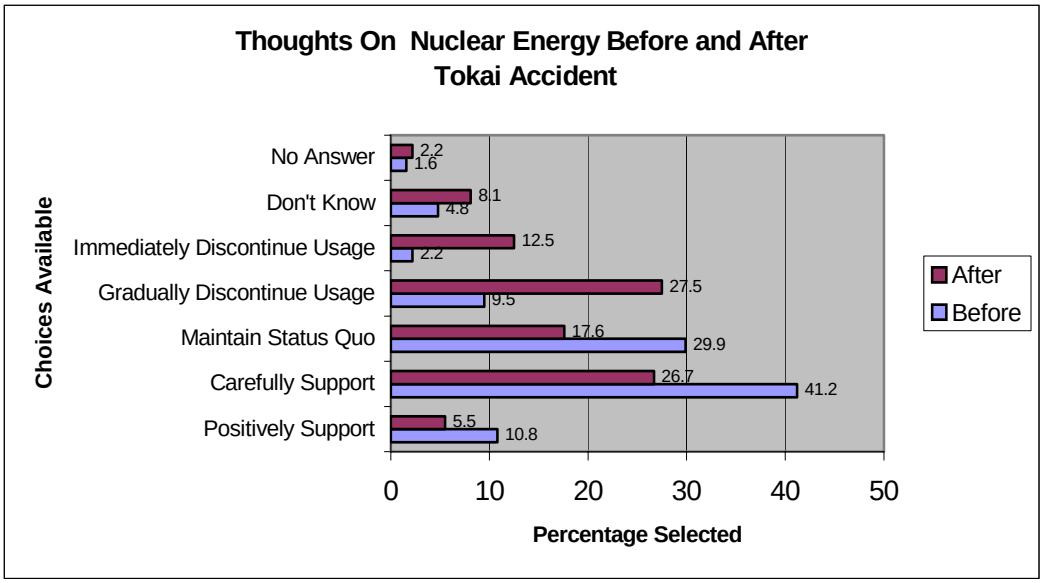
(Source: Mainichi Shimbun, 11/11/99)

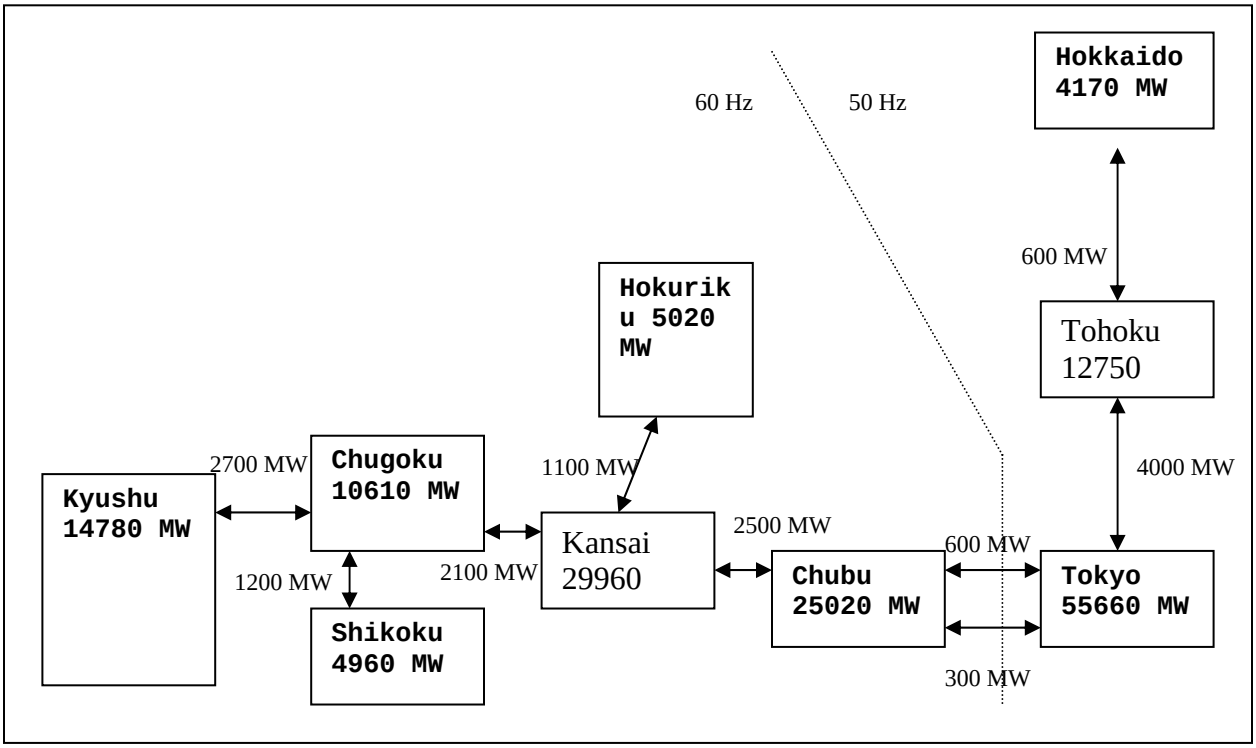
(Source: Asahi Shimbun, 10/11/99)

POLLS OF TOKAIMURA RESIDENTS FOLLOWING THE CRITICALITY ACCIDENT IN LATE SEPTEMBER 1999



(Source: Tokaimura Village Government Planning Section, 2/16/00)





Japanese Transmission capacities and peak loads

[i] **Yergin, Daniel, Elk, Dennis, and Edwards, Jefferson, "Fueling Asia's Recovery."** ***Foreign Affairs*** **Vol. 77 No. 2 p. 36**