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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

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 during the end of World War II and 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.

Yet this may be changing. 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 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 that will stimulate sustainable economic growth such as deregulation and privatization. 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. 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 supplies 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.

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.

Japan's Ministry of International Trade and Industry (MITI) continues to target increases in alternative energy sources such as nuclear energy and renewables. Should Japan manage to stay on track for oil to decline in its share of the domestic energy market, Tokyo might be worrying for naught about its input into and participation in an Asian contest for increasing oil imports. Under scenarios where oil continues to lose market share to other fuels and conservation, the Baker Institute projects Japanese oil imports may 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. 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 won't be a critical factor pitting it increasingly in competition for oil supply with its neighbors or fueling increasing tightness in international oil markets. Japanese policy makers can also take a more relaxed view in reevaluating oil security policy, relying more heavily on market-oriented, commercial solutions such as deregulation of electricity markets and privatization of Japan's exploration companies.

However, the continued accumulation of wealth, combined with the current limits on conservation technologies in the transport sector, still 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. At the same time, 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.

Public opposition to the use of nuclear power has existed since the first nuclear power plants were built in the 1970s, but had historically little effect on the Japanese government's policies. Government opinion polls throughout the 1980s and 1990s showed that a majority of Japanese found nuclear power plants "safe" or "somewhat safe." This allowed officials to ignore localized public protests against the plants. Arguments promoting nuclear power to enhance energy self-sufficiency overrode arguments over its dangers, even after occasional accidents at nuclear power plants highlighted safety risks.

But political and social changes occurring in Japan in the mid- to late-1990s 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 use of the Internet to organize opposition.

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 March 2000, 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 shattering 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 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.

The dominant Liberal Democratic Party (LDP) fears an electoral backlash if it does not 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).

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. However, given the risks to facilities from earthquake or accident, high construction costs for new nuclear power plants may make their electricity rates uncompetitive in a transparent, deregulated marketplace. Moreover, the disposal costs for spent fuel are also rising, further worsening the potential profitability of nuclear facilities in a competitive marketplace. Still, if economic and technical risks can be overcome, several other factors argue for nuclear energy: it adds to diversification; it reduced dependency on oil; it can be produced at a stable price; and it a clean fuel in terms of emissions. This argues for more intervention and research on safer practices for nuclear energy.

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 heavy 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.

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

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. 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.

Investment in the oil and gas industry is cyclical, and thereby the dynamics of supply and demand fluctuate, causing price volatility. Adding to this structural volatility, there are several discontinuities that can emerge to aggravate price movements. The most common is a policy-related shift 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.

Besides OPEC policy, there are also sudden truncations of supply that can constitute a discontinuity. Such disruptions can arise from war (civil or international), accident or embargo. Experience shows that these latter events are likely to be of short duration, and that their impact can vary widely depending on the way spare capacity and inventories are utilized. In many instances, OPEC countries with spare capacity have raised production to meet market shortfalls during temporary supply disruptions. Thus, it may be unnecessary to adopt a wide variety of draconian practices to prepare for the occurrence of these sudden disruptions. 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.

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 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 US-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.

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. 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. In addition, 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. It also relieves Japan of the painful debate and the potential expense of increased militarization. At the same time, the U.S. security relationship, by virtue of its role as a substitute for Japanese remilitarization, ensures 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. 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.

Japan should have no doubt that the U.S. navy has the capability to ensure that oil and gas supplies can flow freely 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. China is purchasing military equipment from Russia but aspirations for industrial cooperation have not yet materialized.

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.

Even in the very unlikely scenario that the U.S. were to shirk its responsibilities under the alliance to defend Asian international waterways (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. 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.

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.

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 developing 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.

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 and should take an active role in engaging China in the process although it must guard against squashing tendencies toward a multilateral approach to problem solving in the region. It should also avoid fueling enmity and paranoia by pushing too strongly on bilateral relationships and pressing allies to rally around programs that will be perceived as untenable, direct security threats against China and North Korea, unless circumstances clearly warrant those programs.

One means to relieve the pressures expected on the Strait of Malacca over the next decade would be for Japan and China to diversify energy import routes. In this regard, proposed natural gas and oil shipments from the Russian Far East stands as an attractive alternative. Imports from this region 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.

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, will 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.

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 since 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 demand for change comes also in the electricity market of Japan. Currently, this market is heavily regulated, with the 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 the 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.

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 security costs of restructuring Japan's energy industries will be less if oil supplies can be counted on to remain ample in the coming years. 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 expected market surpluses or deficits over the next decade.

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. In fact, over the coming years, improved performance from non-OPEC is possible because spending is being shifted from the former Soviet Union to regions likely to offer more immediate output benefits such as Africa and South America. Between 1992 and 1999, private international oil companies invested on average $10-12 billion a year in the former Soviet Union, but production from the region only made slight gains of around 200,000 b/d. By comparison, private international investment in Africa and non-OPEC Middle East over the same period of about $3 to 4 billion a year yielded substantial output increases of close to 1 million b/d.

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 defend prices below $20.

Persian Gulf oil producers are also debating reopening their hydrocarbon sectors to Western private 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 1 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.

If ample oil supplies materialize in the coming years, oil prices will increasingly be driven by transportation economics rather than political relationships. For Japan, this is likely to mean increased access to Persian Gulf supplies that will enjoy transportation cost advantages for shipments to Asia compared to other more distant markets.

Under a scenario where oil consumers face di-

verse, 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."But Yergin's vision rests on the reality that massive energy infrastructure investments required throughout Asia will take the cooperation of neighboring and distant powers, transcending nationalistic or ideological urges.

Current trends in Asia – above all, the ongoing globalization of regional economies and deregulation of the energy sectors – are both increasing the incentives for cooperation and raising the costs of conflict for importing countries. Indeed, it is becoming increasingly 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. Collective memories of Japan's aggression in the 1930s and 40s remain strong in China and Korea. 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.

Sino-Russian relations were similarly uneasy during the early years of Soviet communism given the 1969 border clashes and China's view that the Soviet Union was bent on subjugating it. While China has recently sought limited strategic cooperation with Russia on arms sales, energy and coordination on certain international positions, mistrust remains. More recently, in response to NATO intervention in Kosovo, Chinese fears have centered on suspicions that that the U.S. feels unconstrained in interfering in the internal affairs of sovereign nations. Finally, a divided Korean Peninsula and the ambiguous status of Taiwan remain flashpoints for conflict.

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, 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.

At least for the foreseeable future, 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. 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) The United States should carefully consider any significant alteration of the current level of US-Japanese 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 to containment strategy. 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 based mainly 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 the 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 adapt 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 sealanes 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 providing joint environmental protection of vital waterways in Asia.

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