

## **Japan's Energy Situation: Present and Future\***

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Japan is a country with very scarce energy resources, and this situation has continued through the two oil crises in the 1970s to the present day. During the past decade there have been three main pillars in Japan's energy policy. These generally are called the "3Es." They are, first, economic growth—that is, ensuring Japan's economic growth; second, energy security—that is, the ensuring of security in the field of energy; and third, environmental protection—that is, protection of the environment, and in particular our response to the problem of global warming.

In order to realize these "3Es," specifically Japan so far has been making efforts in four areas: first, the strengthening of energy conservation measures; second, promotion of the introduction of new energy; third, promotion of nuclear energy development; and fourth, expansion of the use of natural gas. Japan is advancing these four policies. My explanation from now on will be based on the Energy Supply and Demand Outlook Toward 2030, which was compiled and released in 2004.

First of all, let me explain about what forms of energy make up Japan's energy supply sources. In 2000 oil accounted for a share of 50% of Japan's total energy supply. A major target of the government is to lower this share to around 40% by 2030. In order to fill this gap, the government is now promoting, with a future outlook, the development of new energies, such as hydro, geothermal, and renewable energy, and it is also planning to increase the share of nuclear power and natural gas to an extent.

Because a period when the price of oil was cheap continued from the middle of the 1980s to about 2000, the public's interest in energy problems declined quite a lot at this time. Recently, however, perhaps because the international situation concerning energy has undergone such a major change, I think that the public's interest has been increasing over the past few years. In this way, I think it is true to say that a paradigm shift is taking place with regard to energy. I would like to explain this phenomenon in terms of the "3Ss."

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The first “S” stands for security, which has become an important issue. Partly as a result of the terrorist attacks in the United States on September 11, 2001, political and social instability in the Middle East have been further intensifying. At the same time, in Asia, China has become a large importer of energy, and its imports are expected to further expand from now on. Also, Russia is further enhancing its international presence in the energy field.

The second “S” stands for sustainability. First of all, as the economies of developing countries around the world, centering on China and India, develop from now on, energy demand is going to increase. In this situation, the problem of the sustainability of energy supplies has emerged as a major factor of concern. In other words, are worldwide energy supplies going to be sufficient in 20 or 30 years time? Also, needless to say, there is the problem of global warming. Amid the increase of carbon dioxide emissions as a result of the consumption of fossil fuel energy, the Kyoto Protocol is the first step in measures to counter global warming. But can we protect the global environment from a more long-term point of view? It is in this sense, I think, that sustainability is now emerging as the other side of the coin in relation to the energy problem.

The third “S” stands for stability of the market. Specifically, the prices of energy resources have been rising sharply since around last year. The prices of crude oil, natural gas, coal, and various natural resources, including iron ore, are increasing. In particular, the crude oil price, such as the WTI [West Texas Intermediate] crude oil futures price, has risen to more than \$60 per barrel and, as you know, is continuing to set new records for the highest market price. Against the background of this rise in energy prices, supply is unable to keep up with the increase of worldwide energy demand, and various bottlenecks are appearing on the supply side.

These “3Ss” that I just spoke about are not problems that can be solved in the short term. Solutions will take a considerable amount of time for the problem of regional stability in the Middle East, the problem of global warming, and the problem of investment in energy equipment. It is for this reason that I think a paradigm shift is occurring in the environment surrounding the energy situation.

One factor is that the energy shortage in Asia as a whole is becoming increasingly serious, and this trend is probably going to continue to intensify from now on. Against this background, the governments of energy-importing countries in Asia, such as China and India, have been engaging in active resource diplomacy recently. In particular, looking at oil resources and natural gas resources, we see that at present about 80% of proven reserves are controlled by the governments of the producing countries or national oil companies under the control of these governments. One of the

factors behind the recent rise in crude oil prices is the peak oil theory, which argues that world oil production is going to reach a peak in the near future and will not be able to increase anymore. Personally speaking, regarding this peak oil theory, I do not believe that a peak in oil production is getting near as a result of the exhaustion of resources geologically. Rather, the problem is that although there are resources, investment to develop those resources will be inadequate. I think there is a possibility that the oil supply capacity will not increase as a result of this factor. Looking at the world as a whole, as I said earlier, there are still resources in such regions as the Middle East, Africa, and Russia. The biggest issue is whether or not enough investment will take place to develop these resources.

Looking at the domestic situation in Japan, however, we see that interest in the energy problem is relatively low. The public's interest in environmental problems is high, but until recently interest in the energy problem was low. To put it simply, the attitude spread among the public that oil is abundant and can be bought anytime as long as you have money. And this attitude was strong among policymakers, too.

Furthermore, in the last four or five years Japan has adopted an energy policy that lacks a comprehensive strategy. The most typical example of this was the abolition of Japan National Oil Corporation about one and a half years ago. Actually, there was a period until around 2000 when the price of crude oil was low, between \$10 and \$20. At that time of cheap oil prices, it was judged that the JNOC was inefficient in oil development, so the government decided to abolish it. Recently, however, the price of crude oil has risen, and looking at things from the perspective of current prices, we can say that the oil fields developed by the JNOC in the past are not necessarily inefficient. Indeed, they are achieving some positive results in a way. So I think that the negative effect of making decisions on policies through short-term judgments is now becoming apparent.

One more thing, regarding nuclear energy, which is very important for Japan, it has been criticized because, economically speaking, the cost is higher compared with power generation using, for example, natural gas or coal, or because it is not economical when such costs as the reprocessing of spent fuel are included. Also, the liberalization policy is being promoted in the field of electric power with the introduction of the principle of competition. From the perspective of measures to counter global warming, however, nuclear power is an important energy supply source that does not emit any carbon dioxide. In this new environment, therefore, a debate is again beginning about how the government should develop nuclear energy in the long term.

Furthermore, looking at the energy self-sufficiency ratios of Japan and the main countries of Europe

and North America, we can see that even when nuclear energy is positioned as an indigenous form of energy, in 2003 Japan's self-sufficiency ratio was at a low level of less than 20%. Japan imports all of its uranium. If uranium is calculated as an imported energy, then the ratio of indigenous energy to the total in the real sense is at an extremely low level of just 4%. Regarding nuclear power generation, however, if Japan could separate plutonium from spent fuel and reuse it, since that plutonium could be considered as an indigenous energy, in the future it would be possible to increase the self-sufficiency ratio in the strict sense through the recycling of spent fuel. The foremost issue that Japan should tackle from now on from a long-term perspective is the improvement of the energy self-sufficiency ratio. Specifically, this involves the development of nuclear energy, the development and use of new energies, such as solar energy, wind power, and biomass, and the development of energy conservation technologies.

In the long term, however, there will be no change in Japan's dependence on imports for oil, natural gas resources, coal, and so on. So the second major problem, I think, is the need to continue efforts to diversify energy supply sources and disperse import sources. Accordingly, the development and use of oil and natural gas resources in Far East Russia (Sakhalin and East Siberia), which is close to Japan and East Asia, will be an important issue for Japan from now on. Furthermore, it will be important to expand the use of natural gas, which Japan imports and uses in the form of liquefied natural gas. For this purpose, the expansion of the domestic pipeline network is another important issue that Japan should tackle from now on. And it is also necessary to promote an expansion of the clean and stable use of coal.

The first pillar in Japan's national strategy for energy from now on will be the development of resource diplomacy emphasizing national interest. It is necessary for Japan from now on to further strengthen its resource diplomacy vis-a-vis the Middle East, Russia, and the countries of the Asia-Pacific region. In this context, since the Japan-US alliance stands at the axis, Japan should base its efforts on the utilization of the global power that the United States possesses. Second, in consideration of Japan's geographical position, the building of an energy and environment community in Asia as a whole will probably become a long-term issue. At present, as you know, problems of competition and confrontation over energy resources are surfacing in Asia, especially between Japan and China. However, as energy consuming and importing countries, Japan and China also have common interests, and at present they are advancing specific efforts toward cooperation in the energy field within the ASEAN+3 framework. From the point of view of gaining benefits through cooperation, I think that more efforts are required to promote a cooperative setup in Asia. And third, as I mentioned earlier, we must tackle technological development in the field of energy in a more strategic manner.

Taking these factors into account, what should be Japan's national strategy setup for energy from now on? First, from now on it is necessary to promote comprehensive efforts bearing in mind national interest. Since the energy problem is increasingly indivisible from various other problems, such as security, diplomacy, crisis management, trade, and science and technology policies, comprehensive efforts with strengthened coordination on the policy side with these other issues are becoming increasingly important.

Second, it is necessary once again to clarify the division of roles and responsibility setup between the government and private companies. In Japan, the government and private companies have been promoting energy policy in unison for a long time. Amid the advance of liberalization and deregulation of the energy market, the relationship between the government and private companies has changed enormously. If anything, the relationship has become cool and distant. Recently, for example, the government and private companies have become confrontational over such issues as the abolition of the JNOC, which I mentioned earlier, and the problems of electric power liberalization and nuclear energy. In this situation, we cannot make the comprehensive efforts that I just spoke about. In this sense, from now on it is important for the government and private companies to work together and adopt policies in areas where they can mutually cooperate, especially external resource diplomacy and policies for the securing of resources.

Finally, the important thing at present, especially in the case of Japan, is that, when deciding policies, it is impossible to have comprehensive efforts unless policies are decided and implemented over the walls between ministries and agencies. For example, I think it is necessary to create a setup for more comprehensive decision making in which the government leaders can make decisions by establishing a sort of "energy strategy council" above the individual ministries and agencies.

#### QUESTIONS AND ANSWERS

Q: Does the fact that Japan's energy self-sufficiency ratio stands at 20%, or about 4% if the nuclear energy part is excluded, mean that Japan should devote more effort to its nuclear energy policy?

A: The plan is to increase Japan's energy self-sufficiency ratio, including nuclear energy, from just less than 20% now to 25% or even 27% by 2030. If the self-sufficiency ratio is going to be further increased, I think that the expanded use of nuclear energy is the only answer. The current plan is to build nine new nuclear power stations by 2030. In a situation in which demand is kept at the present level by energy conservation measures, the self-sufficiency ratio will rise to 27% or 28%. So the ratio can be improved to an extent. The achievement of this target is the most important issue that we should tackle from now on.

Q: To what extent do you think that Japan could benefit from its alliance with the United States to activate its resource diplomacy in the Middle East? For example, China has made very good relations with Iran and Sudan, although these countries are described by the United States as terrorist states or terrorist-supporting states. Recently also China has been strengthening relations with Saudi Arabia and other oil-exporting countries in the Middle East. So do you think it will be a merit or a demerit for Japan to depend on the United States to strengthen its relations with Middle East countries?

A: That's a very difficult problem. In the present environment, the United States is disliked in Middle Eastern countries, so there is a demerit. Specifically, for example, Japanese companies are now engaged in the development of the Azadegan oil field in Iran, and conversely speaking, the United States is trying to apply the brake here. When we think about China, or Russia, or the Middle East as a whole, since the security and political relationship between Japan and the United States lies at the base, there is a problem of choice in the field of energy as well. In the Middle East, I think the reality is that there are perhaps many disadvantageous points.

Q: Last week there were reports that the Ministry of Economy, Trade and Industry had made a shift in policy from market liberalization to the ensuring of stable supplies. In relation to your proposals, can you tell us what specifically has been suggested?

A: In the securing of energy resources for Japan, it is important for the government to play an important role once again and to promote a national strategy. My view is that the government has taken a step toward considering what it should do from now on for this purpose. In terms of resource supply, especially in Asia where Japan is located, governments in such countries as China and India are taking the initiative in the drive to secure resources. Japanese oil development companies are small in scale and really unable to compete. In these circumstances, the government has come to have a sense of crisis that Japan is lagging in the securing of resources. So I think that we can see this as a specific policy move to change course a little from now on.

Q: You mentioned new energies. To what extent can biomass, for example, be increased by about 2030? What are the possibilities here? For instance, there is talk about importing ethanol from Brazil. Also, what are the possibilities for technical cooperation with China?

A: First of all, let me talk about new energies. This does of course depend on the definition, but if we take new energies to mean renewable energy, such as solar, wind power, and biomass, at present these account for around 1% of Japan's total energy supply. I think the ratio of renewable energy can be raised to 5% by 2030, but raising it to more than 10% will be extremely difficult.

Regarding your second point about cooperation with China in the field of energy conservation, if Japan and China can build a win-win relationship from now on, since Japan has taken the lead in

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terms of technical cooperation and systems in the fields of energy conservation and the environment,  
I think there is plenty of room for cooperation in these fields.

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