# Interim Report

June 2006

**Energy Security Study Group**

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The energy-related problem facing Japan is constantly the problem of energy security.

During the 1st and 2nd oil shocks, Japan moved to promote energy-saving efforts as well as to develop nuclear power and natural gas as a way to diversify energy resources and create a healthy energy supply and demand structure. In addition, the government established reserve and emergency response systems.

In recent years, we have seen an increased worldwide awareness of rising oil prices and the resulting energy security problems, but, as is describe below, we see the following differences compared to the 1st and 2nd oil shocks.

On the supply side, while OPEC production capacity and American and Japanese refining capacity continue to decline, we see resource nationalism among certain oil and gas producing nations as well as the possibility of acts of terrorism against energy facilities and supply routes.

On the demand side, the rapid increase in the world population, particularly in China and other developing nations, together with rapid economic growth in these nations, has led to a dramatic increase in energy demand.

One of the most urgent issues facing Japan is the creation and implementation of an energy security policy that will allow the country to respond to these issues and other new energy security risks, which are inherently different from traditional energy issues.

This Energy Security Study Group was established in December 2005 as a private Study Group under the Director-General of the Agency of Natural Resources and Energy with the purpose of evaluating policies related to Japan's future energy security. This council has cooperated with specialists in the fields of energy, diplomacy, defense, economics, finance, and culture as well as with representatives from businesses in the energy industry to examine what kinds of measures, including the diplomatic and defense matters, should be applied toward the larger energy supply chain as Japan, which suffers from a lack of domestic energy resources,

attempts to confront the major risks facing its energy security. (6 sessions of the Research Council, 5 sessions of the Working Group)

Through our evaluations we identified the major energy risks as: (1) political conditions in the Middle East, (2) terrorism, natural disasters, and accidents (misconduct), (3) reduction of investments from supply nations, (4) trends of demand nations (China, India, etc.), (5) issues facing the energy industry. For each major risk we evaluated prevention measures, structural improvement measures, and emergency response measures. For the main theme of the measures, on top of considering the time frame and the international countermeasures, we considered “with whom” measures would be taken, dividing the task of policy enhancement into two categories: (1)enhancing international countermeasures and (2)enhancing domestic countermeaseres.

Further, considering the progress of evaluations conducted by sub-sections and sub-committees of the Natural Resources and Energy General Research Council,we delved deeper into (1) Asian cooperation, (2) support of the natural gas business, and (3) strengthening partnerships for emergency response. These are universal issues that will lead to future action plans.

As indicated above, this Interim Report provides a summary of energy security measures that will be used to approach imminent major risks facing Japan.

## I. Goals of the Energy Security Study Group

○ Energy creates the foundation that supports a nation, from the economy and industry to everyday livelihood, and significantly affects the issue of national security.

○ Historically, in the 1970's, supply - demand balance were controlled by supplying nations, but, after the oil shocks and moving into the 1980's, prices became linked to the market. Competition based on utilization of the market mechanism is vital, and it is necessary that this mechanism be used to its maximum potential. However energy security cannot be ensured only through the use of this mechanism.

○ To ensure energy security, the government must be actively involved in areas that is hard to be covered only by the market mechanism(for example, the vital risks of energy security mentioned below).

○ As is seen with the recent rise in crude oil prices, internal and external problems facing energy security becomes quickly evident as a result of changes in the state of energy supply and demand. Various nations are enhancing their energy strategies with a focus on security. Japan lacking natural resources must, through the collective efforts of the public and private sectors, work to enhance its medium and long-term comprehensive and strategic measures against the following major vital risks associated with energy security.

<Major risks associated with energy security>

- Problems in the Middle East, which Japan is heavily dependent on for energy resources, such as opposing religious groups and tension with the US and Europe over nuclear matters, have grown complex and pose the greatest threat to energy security.
- In addition to natural disasters and accidents (misconduct) involving the international and domestic energy infrastructure, the possibility of terrorism against infrastructural facilities and safety issues on sea-lanes affecting the energy supply pose risks.
- Increased domestic management of energy resources and

stronger restrictions against foreign investments by supplying nations threaten energy security. Intervention by supplying national governments worsens investment conditions for foreign companieswith advanced technology, thereby forcing out foreign investors and leading to a medium to long-term decline in the total supply capacity all over the world.

- A risk exists due to the possibility that Asian countries, particularly China and India which are experiencing dramatic growth, resort to exclusionary activities, such as purchasing energy at high price, in the event of an emergency. This is especially a risk because many Asian countries have not yet experienced an oil shock.
- Domestically, while there is little risk of damage to a safe and stable energy supply under normal circumstances, the possibility of domestic deregulation leading to increased competition, reduced investments, and an eventual decline in the domestic supply capacity poses a risk.

○ When addressing these vital risks, we must conduct a broad evaluation of measures, including those in the diplomatic and defense sectors, to apply to the entire energy supply chain and must use this evaluation to point out a direction for Japanese energy security measures.

## II. Target of Energy Security (“What do we protect?” )

○ As energy is the foundation of domestic livelihood and economic activity, the most important objective for Japan is to guarantee the supply quantity of energy necessary for the domestic economy and livelihood at an appropriate price. As such, the entire energy system requires sufficient capability to develop not only the upstream but also midstream and downstream sectors such as transport and distribution to consumers. However, we must ensure that these efforts do not result in inciting international competition over the acquisition of resources.

○ Japan’s economy and industry are part of an Asia-centric international network of division of labor. Being mutually dependent on Asian and world markets, it is utterly vital that Japan be able to coexist within the world economy. Energy markets also are linked internationally, and thus, to ensure Japan's energy security, we will require working with the international community to address and to contribute to solving Asia’s and the world’s energy problems.

## III. Energy Security Risks (“Protection from what?”)

○ We conducted a comprehensive evaluation of risks to energy security, pertaining to the issues involving diplomatic and defense matters and the domestic supply chain, based on the state of affairs through 2030.

○ During this evaluation, we looked to determine whether or not those risk factors were physical (risk of temporary cutoff of current supply (including routes)) or economic (no risk of temporary cutoff of current supply (including routes) but risk of excess-demand or sharp price increases).

○ We further conducted a comprehensive evaluation of the magnitude of the effect and the frequency of the above risks to determine which vital risks could have a significant effect on Japan’s civil livelihood and economic activities. As a result of that study, we were able to extract the following risks: (1) political conditions in the Middle East, (2) terrorism, natural disasters, and accidents (misconduct), (3) withdrawal of investments from supply nations, (4) trends of demand nations (China, India, etc.), (5) issues facing the energy industry.

### 1. Political conditions in the Middle East

○ In today’s international energy market, we see many unstable elements involving energy supply nations. Of those, the most pressing is the increased instability surfacing the Middle East, a region that possesses about two-thirds of the world’s oil resources.

○ There are many unstable elements related to political conditions including: (1) the destabilization of the situation in Iraq, (2) the threat of terrorism throughout the Middle East, (3) unclear outlook for peace in the Middle East, (4) backlash of the Arab and Islamic community against the US, whichinitiated the Iraq war and pushes for democracy in the region, (5) tensions between Iran and the US and Europe over nuclear matters, (6) instability of Middle Eastern governments and political systems (aging leaders, growing youth population, unemployment), (7) religious confrontation in the Middle East, (8)

regional differences (domestically and with neighbor nations). Any of these elements could potentially have a dramatic effect on the stability of international energy markets.

○ The instability of the political environment and other geopolitical risks have become more complex, and there is concern that they pose a large scale threat to energy security.

○ Much attention is given to how problems related to the political environment in the Middle East will affect oil security but, considering that natural gas will come to play a greater role in the entire energy structure and that the natural gas supply from the Middle East will grow in importance, it will become vital to also pay attention to the trends occurring in major gas supply nations in the Middle East.

2. Terrorism, natural disasters, and accidents (misconduct)

○ Recent problems that have given rise to concerns about energy security include: the 9/11 terrorist attacks and the following multiple acts of international terrorism, the effect on oil export caused by declining domestic safety and increased terrorist activities in Iraq; last year's hurricane damage in the US; and accidents and misconduct related to energy supply facilities. These events lead us to believe that terrorism, disasters, and accidents (misconduct) involving domestic and foreign energy infrastructure and the energy supply chain represent a vital risk to future energy security. From this perspective, safety within the energy transport sector becomes vital, and safety issues in the Straits of Malacca and other sea-lanes also represent a risk to energy security.

3. Reduction of investments from supply nations

○ As rising energy prices and increased international energy supply and demand become larger problems, investments to ensure that supply capacity can meet future growth in the energy demand have become even more important. However, some of the world's major supply nations now treat domestic energy resources as a strategic product

and strengthened their structures of government management of the energy sector, including moving away from foreign investments. In other words, the involvement of supplying-nation governments in the energy market acts as a restrictive element against the promotion of investments.

○ For example, Russia, which has rapidly increased its share of the international market through massive oil and gas production, is treating energy as a vital source of power within its national strategy and has increased the level of government management of the oil industry through measures such as the submission of a revised natural resources bill to the parliament. There is growing interest in how these movements by Russia will affect international energy markets. Venezuela, too, a major oil-producing nation in South America, has increased the government's involvement in the oil industry and has implemented strict legal systems that make investments by foreign nations difficult.

○ These increased geopolitical risks in oil-producing nations will lead to decline in the investment environment. For example, risk factors such as the nuclear issue in Iran, conflict in Nigeria, and worsening domestic public safety in Iraq have made it increasingly difficult for foreign companies to invest and operate in these oil and gas-producing nations.

○ Increased risks in major oil and gas-producing nations and growing government involvement in the energy sector ("politicalization" of energy markets) have made investment conditions worse for foreign investors, who bring technological prowess. As a result, there is concern that restrictions and eventual reductions in foreign investments will cause a medium to long-term decline in the supply capacity of all supplying nations. This could possibly represent a structural risk to energy security.

4. Trends of demand nations (China, India)

○ The level of energy demand is growing siginificantly in developing Asian Countries, particularly in China and India, and we see a growing

dependence on energy imports. This trend will continue, and we can expect to see increased energy demand and imports along with the region's strong economic growth.

○ These dramatic increases in energy demand in China and India are now gathering attention as elements that could cause a medium to long-term strain in the international energy market. In addition to effects on medium and long-term supply and demand, concern also arises regarding trends of these demand nations which may creat short-term instability within the markets. As these demand nations face increasing dependency on imports, we are beginning to see them develop full-scale policies and strategies to ensure energy security. However, if future events hinder supply within the international energy market, actions taken by China and other demand nations, which have not experience past oil shocks, could have a significant impact on the stability of the international energy market. If these major demand nations take exclusionary action in crisis, there are risks of accelerated market instability as well as greater strain on supply and demand and rising oil prices. Because of this, future energy trends and movements of China and other demand nations could become major risk elements that can threaten energy security.

## 5. Issues facing the energy industry

○ To ensure energy security, the entire energy system must have sufficient capability to develop not only the upstream but also midstream and downstream sectors such as transport and distribution to consumers. This is not limited to oil but also applies to natural gas and electricity, meaning that the development of infrastructure such as power plants, pipelines, and electricity transmission networks will be vital. However, we can see many structural changes in domestic energy markets and we believe this, too, could have an effect on energy security.

○ One example of this is the effect of deregulation of energy markets. The purpose of deregulation of energy markets is to introduce competition, enhance market functions, and, as a result, reduce energy

costs while increasing efficiency. However, it is anticipated that during this process, operators in the energy industry will be faced with uncertainty regarding future economic and operating environments, as well as uncertainty regarding their ability to secure demand, which will lead to intensified competition. Furthermore, the predicted decrease in the Japanese population will likely lead to weakened energy demand and, subsequently, to a reduction in investments of the industry. This alone introduces a restrictive element on facility renewals and other facilities investments. As such, there is a distinct possibility that the energy industry will take a very cautious approach toward large-scale investments in energy supply facilities. The possible pursuit of cutbacks as a way to reduce costs could result in a decline in supply capacity within the energy supply chain.

○ If we are faced with terrorism, natural disasters, or accidents (misconduct) during a time when we already experienced a decline in domestic supply capacity, we could see an energy supply bottleneck due to significant strains on power facilities, electricity transmission networks, domestic vessels and the entire supply chain used to provide energy to consumers.

○ As such, there is significant concern that problems confronting the domestic energy industry resulting from structural changes caused by deregulation of energy markets could become major risk elements threatening energy security.

## IV. Energy Security Policies and Measures ("Who uses what to work with whom?")

○ As measures against vital risks that could possibly seriously effect Japan, we examined the following: (1) preventative measures (measures to prevent the occurrence of risk phenomena), systematic improvement measures (preemptive measures to reduce the post-occurrence effects of risk phenomena), or emergency measures (measures implemented after the occurrence of risk phenomena), (2) private sector response, government response, or joint response, (3) short-term response or medium to long-term response, (4) relation with major nations (the US, China, Russia etc.), international frameworks (G8, IEA, IEF etc.), and regional frameworks (ASEAN+3, East Asian Summit (EAS), APEC etc.).

### 1. Measures against energy security risks

○ Ensuring Japan's energy security first will require the development of present and future international energy situations, as well as a clear understanding of the risks within such frameworks that would pose a threat to energy security.

○ It is also vital that we construct and prepare appropriate responses to risks to energy security.

○ Further, for each of these risks, we believe an effective basic policy will involve promoting the development and preparation of the following.

i) Preventative measures (measures to prevent/avoid the occurrence of risks and threats)
ii) System improvement measures (measures to improve our ability to reduce the effects of risks and threats after they appear)
iii) Emergency measures (measures to be implemented after the appearance of a risk and threat)

○ Based on this approach, Attachment 1 provides an overview of measures broken down into three categories – preventative measures,

systematic improvement measures, and emergency measures – for each of the 5 major risks presented earlier: (1) political conditions in the Middle East, (2)terrorism, natural disasters, and accidents (misconduct), (3) withdrawal of investments from supply nations, (4) trends of demand nations (China, India, etc.), (5) issues facing the energy industry.

2. Energy security response measures

○ When considering the content and characteristics of response measures, it is important to organize measures based on the type of measure (government response, private sector response, or joint response) and the time frame of the response (short-term vs. medium and long-term). Also, concerning international measures, it is necessary to maintain a perspective that takes into account with whom (or against whom) measures will be taken and consider the relation of those with major nations (the US, China, India, Russia etc.), international frameworks (G8, IEA, IEF etc.), and regional frameworks (ASEAN+3, East Asian Summit (EAS), APEC etc.).

○ Based on this perspective, we have considered below the vital measures into two categories: international measures and domestic measures (See Attachment 2).

(1) Enhancing international measures

i) Strengthening Asian cooperation

○ Moving forward, cooperation will be vital with China, India, and other Asian energy consumer/import nations, which have an ever-growing level of influence on the international energy market. The following types of measures will be required to address risks related to new major import nations such as China and India.

(a) Energy cooperation is vital to the stability of energy markets, and the development and cultivation of a shared awareness of mutual benefits are fundamental policy. To secure this awareness, we

must look to effectively utilize regional frameworks such as ASEAN+3 and EAS within relationships with Asian consumer nations.

(b) Specific areas of cooperation include energy conservation and environment-related technology, oil reserve system development, outflow/usage technology and know-how, technology related to nuclear energy, new energies (biomass, etc.), clean use and safe production of coal, and overall contributions to energy diversification. Cooperation on the supply side, including market environment development, joint development projects, and infrastructure creation, will make it possible to take advantage of technology cooperation.

(c) Further, we must work to develop and enhance international emergency situation cooperation systems. This will involve cooperation in reserves use within the framework of IEA and other international schemes, as well as evaluating the creation of regional frameworks for energy cooperation in Asia that include sharing available oil systems for emergency situations.

ii) Enhancing contributions to and cooperation with supply nations

○ Supply nations, key elements of international energy markets and vital to Japan's energy security face many risks. To mitigate these, we must enhance contributions to and cooperation with supply nations.

(a) In addition to working to prevent conflict and terrorism in the Middle East region, it is vital that we look to restrain government intervention such as government management of national resources and regulations on foreign investments as well as eliminate elements restricting investments. To accomplish this, we must: (1) contribute to peace and stability in the Middle East, (2) cultivate an awareness of mutual dependence and benefit between supply and demand nations (WIN-WIN), and (3) cultivate an atmosphere of trust and goodwill.

(b) Based on this perspective, in addition to strengthening our

diplomatic efforts, in the medium and long-term we must use Japan's technological strengths to promote human development and nation building in supplying nations, collaborationing between the public and private sectors to enhance our contributions and cooperation. Potential areas for collaboration include education, job training, industry promotion, infrastructure development, water resource development, the support of democratization and a transition to a market economy based on the climate of each country, student exchanges and internships, improvements to security and safety (provision of information and materials, training, internships), and reducing regional disparity (domestic and neighbor nations).

(c) Further, to help cultivate an awareness of mutual dependence and benefit between supply and demand nations (WIN-WIN), we must promote not only energy resource trading but also broad-based relationships of mutual dependence with supply nations through economic partnerships such as an EPA. Additionally, by utilizing international frameworks such as the IEF, we can create partnerships among demand nations while also working to achieve the vital task of promoting global communication between supply and demand nations.

iii) Strengthening international frameworks and relations with major nations

○ With regards to international measures, it must be important to consider energy security measures based on an awareness of with whom (or against whom) measures to be implemented. To achieve this, Japan must promote the following types of efforts with major nations such as the US, China, India, and Russia, as well as work to strengthen relationships with international frameworks (e.g., G8, IEA, and IEF) and regional frameworks (e.g., ASEAN+3, EAS, and APEC).

(a) Strengthening relationships with major nations

In its relationship with the US, Japan must actively contribute to

and cooperate with international nuclear management efforts, support and cooperate with energy technology development and efforts to stabilize the Middle East, and cooperate with talks occurring within international frameworks, including talks between supply and demand nations. With China, it is important that Japan focus on implementing all the previously mentioned aspects involved in promoting Asian cooperation. In dealing with India, Japan must promote cooperation in the areas of energy conservation and environment-related technology, oil reserve system development, and release/usage technology and know-how. With Russia, we must focus on the fact that Russia may become a major supply nation for Japan and use policy that strengthens our relationship based on mutual benefit and dependency to promote talks and cooperation.

(b) Strengthening relations with international frameworks

To address problems involving stability in the Middle East, the withdrawal of investments from supply nations, and the effects of trends in supply nations on market stability, Japan must strengthen its relations with global frameworks such as G8, IEA, and IEF to promote information sharing, discussion, and cooperation. Also, to address problems concerning the global issue of nuclear management, in addition to strengthening relations with the US and other major nations, Japan must strengthen its relations with global frameworks such as IAEA.

(c) Strengthening relations with regional frameworks

As Japan looks to promote cooperation in Asia and particularly with China, Japan must look to fully utilize the functions of regional frameworks such as ASEAN+3, EAS, and APEC. Specifically, utilizing these regional frameworks to help enhance awareness of the importance of mutual dependence and benefit between the nations involved may aid efforts to strengthen systems of emergency-time cooperation between consumer nations .

(2) Enhancing domestic response measures

i) Improving management system

○ Domestic measures for energy security are also extremely important. Most important is the development and enhancement of systems related to energy security. There are two key elements to achieving this: the development and enhancement of partnerships of systems related to crisis management and the strengthening of a system that continuously considers, blams, and implements measures related to Japan's energy security .

(a) Considering the various potential risks, we must enhance our crisis management, security, and prevention systems, including internal information management systems, that support infrastructure both at home and abroad – the foundation of our energy supply. In addition, we must work to strengthen partnerships between energy corporations involved in crisis management for our energy supply capacity backup system, including domestic vessels the natural gas infrastructure (natural gas pipelines, LNG terminals), and oil refineries, to ensure the maintenance of the domestic energy supply capacity required for times of emergency. This backup system must go beyond individual corporations and extend to an intra-industry, inter-industry, and region.

(b) Further, Japan must strengthen its system of gathering and analyzing information required for energy security, as well as use collaboration between public and private sectors to improve its overseas information gathering system. In addition to constantly considering, blaming, and implementing solutions to problems related to energy security, we also must work to strengthen systems used to follow up continuously on the implimentation of energy security policy and measures.

ii) Fortifying the energy supply and demand structure

○ The second aspect for domestic energy security is to prepare for risks and events that will have an actual effect on energy security through preemptive measures (structural enhancements) that will reduce the effects of such events for Japan. Such measures would be implemented to fortify Japan's energy supply and demand

structure. Many of the policies and measures implemented as part of the effort to secure a stable energy supply fall under this definition, but it is vital that Japan works toward further enhancements. The following measures are divided into: on the demand side (a) promotion of energy conservation efforts and the diversification of energy resources on the supply side, (b) promotion of nuclear power, (c) reduction of oil dependency, (d) securing resources (enhancing the ability to acquire energy, promoting development), (e) reforming market systems and industrial development, and a foundation for the above(f) promotion of technology development Promotion of energy conservation efforts

(a) promotion of energy conservation

Japan is an international pioneer in the field of energy conservation, which we believe to be one of Japan's strengths. To further develop this strength, moving forward, we must not only establish a positive growth cycle of technological innovation and social reform, but also promote public awareness of energy conservation at the public level and work toward comprehensive promotion of energy conservation in the industrial sector, as well as the rapidly growing civil and transport sectors.

(b) Promotion of nuclear power

Nuclear power has to be placed at cornerstone of energy supply expected to fullfill a vital role in energy security and in efforts to address environmental issues.In order to promote nuclear power, Japan, as the only non-nuclear weapon country to have a nuclear fuel cycle program, must actively engage in international efforts to realize both non-proliferation and the peaceful use of nuclear power (through the maximum use of experience and technology to cooperate and contribute actively towards efforts to create an international framework). In addition, Japan must implement backend measures, introduce and standardize more effective safety regulations, and conduct nuclear-related R&D that targets improvements in the safety and economic viability of nuclear power. Furthermore, in order to cultivate and improve local government

trust in nuclear power, government and private sectors must conduct public comment/opinion and relations and provide education.

(c) Reduction of oil dependency

To promote the diversification of energy resources, Japan must develop renewable energy and the technology to promote its use. Further, Japan must consider the development of a domestic infrastructure system to promote the use of natural gas, which has a relatively low environmental burden compared to other fossil fuels (natural gas pipelines will be developed through cordination between corporations and expanded according to demand). Japan must also promote the use of clean coal technology in order to reduce the nation's dependency on oil. In particular, the transport sector has a very high rate of dependency on oil, and should work to diffuse this risk through fuel diversification.

(d) Securing resources (enhancing ability to acquire energy, promoting development)

It is vital that Japan strengthen relationships with supplying nations and promote the development of natural resources. To achieve this, Japan must dramatically improve its provisioning of state-back financing to ease investing company's risk through JOGMEC (Japan Oil, Gas, and Metals National Corporation), maintain and improve development financing support through natural resources financing systems, and increase risk-taking capacity through NEXI (Nippon Export and Investment Insurance). Furthermore, as a way to improve the energy industry's ability to acquire energy ,Japan must work to promote supplier diversification, the development of domestic resources such as methane hydrate, and corporate partnerships..

(e) Market system reform and industrial development

To avoid risks associated with market deregulation, including restrained investment and a decline in supply capacity, Japan must carefully consider how to divide roles between government and private sectors, and must be cautious in its design of regulatory systems. Japan must consider improvements in

management required to ensure capital acquisition, investment capacity, and stable acquisitions, as well as consider industry and organizational structures that will make this possible, from the perspective of a need to achieve the borderless transition of capital funds.

(f) Promotion of technology development
To fortify Japan's energy supply and demand structure for the medium and long-term, we must promote public-private joint development of technology. This includes technology related to energy conservation, and the environment, nuclear power, GTL and other technologies for the effective use of natural gas, IGCC and other clean coal technologies, renewable energy, carbon dioxide collection and storage, nonnative oil and other technologies for the expanded use of heavy oils, effective use of heavy distillates (residue) in power generation and fossil fuels, and power storage and related power system technology.

iii) Improving emergency response measures

○ The third aspect for domestic security policy involves measures to enhance Japan’s response capabilities in the event of an emergency.

(a) To improve our oil reserve capacity, Japan must consider the efficiency and dynamism of the government reserve system as well as develop a system for product reserves.

(b) In order to prepare for a disruption of the natural gas supply from major supply nations or a dramatic rise in prices, we must consider emergency response measures for natural gas. This will involve the intra and inter-industry sharing available gas as well as partnerships and support between LNG import countries in Asiaand over the world. In addition, Japan must promote global LNG business developments by Japanese corporations, including the incorporation of long-term contracts with flexible destination clauses. We also must consider the medium and long-term development and utilization of depleted oil and gas fields for underground natural gas storage.

## V. Policies lead to an Action Plan

○ Of response measures and policy regarding energy security, considering the progress of evaluations conducted by sub-sections and sub-committees of the Natural Resources and Energy General Research Council, we delve deeper into the following universal issues that will lead to future action plans.

## 1. Asian Cooperation

### (1) Risks

○ It is projected that the rapid economic growth of developing nations such as China and India will lead to dramatic increases in energy demand. Projected significant increases in these countries in the number of automobiles by 2030 suggest the possibility of a serious increase in fuel demand in the transport sector. 90% of fuel used for transport is oil, but a decline in production by non-OPEC nations will increase future dependence on GCC nations and other parts of the Middle East.

○ China and other developing nations in Asia where energy is key to economic growth have not experienced an oil shock, a cutoff of their energy supply or even a sharp rise in energy prices. These events could act as a catalyst that, driven by uncertain information, could lead to exclusionary actions, such as high-priced acquisition of energy resources or securing sea lanes, that would only serve to further disrupt an already volatile market.

○ We also face the possibility that such actions by major demand nations could cause further energy strains and drive market prices higher, which in turn could develop into international problems that transcend energy concerns.

○ On the other hand, natural disasters, accidents, or terrorism in the Straights of Malacca, the bottleneck of the supply chain, could also seriously hinder the supply of energy.

(2) Response measures

○ To avoid the above types of panic-based actions by Asian major demand nations, we must increase awareness in the Asian region that unified efforts benefit all. Grounded on this fundamental principle, we must consider the following types of efforts.

i) In order to fortify the Asian energy supply and demand structure, we must cooperate in the areas of energy conservation, environmental cooperation, and nuclear power. All of these areas are also effective against global warming and in the general conduct of the the broad-based promotion of energy cooperation.

ii) Promoting oil reserves cooperation as an emergency response measure is also necessary. Fundamental to this, each country should build its own oil reserves. To help achieve this, it will be most effective for Japan, a world leader in oil reserves, to cooperate by sharing its reserve technology, know-how, and systematic experience.

iii) A significant amount of time will be required before oil reserves can be physically built in the various Asian countries. Until that time, Japan and other advanced countries with reserves must cooperate through international frameworks such as the IEA because insufficient supplies in the Asian region affect international oil markets.

iv) To construct a more stable prevention system, we must consider the creation of Asian energy cooperation frameworks in the form of emergency sharing available oil systems, grounded in the principle that each country in Asia will develop its own oil reserves.

v) Ensuring safe passage through the Straights of Malacca, a risk to oil supply, will require international cooperation from countries near the passage, such as Malaysia, Indonesia, and Singapore, as well as cooperation from the US, China, and Korea. In the medium and long-term, there is a need to develop a new alternate route.

## 2. Natural gas business support

### (1) Risks

○ As of 2005, natural gas represented 13% of Japan's primary energy consumption, and this is projected to increase to 18% by 2030. From this, we see that the importance of natural gas in Japan is increasing. However, the natural gas market has yet to fully develop. Compared to oil, high costs of LNG bases and other infrastructure as well as, limitations on importing sources restrain development.

○ In the future, countries in the Middle East will become major suppliers to the international gas market. These countries face geopolitical issues such as religious conflict and Iran's nuclear issue. Russia will also be a major supplier, and government control over energy resources is growing there. In particular, the Middle East has various risks, and, if these problems realize, it could damage natural gas supply or lead to a sharp rise in prices.

### (2) Response measures

○ In order to cope with risks such as damage to the natural gas supply or a sharp rise in prices, in the short-term there must be sharing available gas intra- and inter-industry and partnerships between countries not only in Asia, but also over the world. In addition, we must promote global LNG business development by Japanese corporations, including the adoption of long-term contracts with flexible destination clausees, investments in overseas bases, securing utility rights, and increasing Japanese business involvement in the international supply chain.

○ In the medium and long-term, we must consider the development and utilization of depleted oil and gas fields for underground natural gas storage.

## 3. Strengthening risk management partnerships

(1) Risks

○ Deregulation could cause intensified competition among businesses and a decline in the incentive to invest in nuclear power facilities due to high initial costs, resulting in a decline in domestic supply capacity.

○ In addition a crisis situation, including terrorism, natural disasters, and accidents (misconduct), overseas or within Japan, could disrupt power facilities, transmission networks, or domestic vessels and could cause a bottleneck in the supply chain that delivers energy to consumers.

(2) Response measures

○ First, in addition to promoting the creation of individual corporate crisis management systems, we also must promote the development of a broad-based crisis management system on intra-industry, inter-industry, and regional levels. Specifically, in the event of a disruption in the natural gas supply or a sharp rise in prices, as mentioned in “2. Natural gas business support”, there must be sharing available gas intra- and inter-industry , as well as between countries not only in Asia, but around the world. Furthermore, we must consider securingdomestic vessels for crude oil transport, on intra- and inter-industry basis which are currently decreasing in number, for use in the case of an energy supply disruption requiring the emergency use of oil . Also, as a measure against the possibility of a natural disaster resulting in a cutoff line supplies (electricity and gas) to specific regions, we must consider systems to ensure supply (kerosene, LPG, etc.) to prevention centers and medical and evacuation facilities.

○ In preparation for crisis situations such as terrorism, natural disasters, or accidents, we must promote the creation of individual corporate crisis management systems, including business continuity plans (to be standardized through ISO) within the energy industry, as well as promote crisis management plans between the government and private businesses.

## - Conclusion -

This report has provided how Japan, which lacks natural resources, should make with the eminent risks to its energy security. Careful attention must be given to how the implementation of such policies and measures would affect our nation's overall foreign strategy.

In other words, policies concerning foreign relations should not be implemented only from the perspective of ensuring energy security, but must maintain a broad view point, including increasing international competition and must be implemented within the scope of their position within Japan's overall national strategy. This will require mutual understanding between top-level national leaders, as well as the understanding of the people.

This Interim Report provides a general overview of Japan's energy security measures, but further consideration is required to achieve full implementation. In particular, cross-cutting policiesthat lead to future action plans require immediate detailed consideration and must be implemented as the title.

Furthermore, as internal and external situatioin affecting energy continue to fluctuate, we must gather and analyze information regarding such conditions in order to have a clear understanding and to be able to consider, plan, and implement an energy security policy that is best suited for the current situations.

## Attachment

# Study Group Member List

## □Energy Security Study Group Members

| | | |
|---|---|---|
| Chairman | Jitsuro Terashima | The Japan Research Institute, Ltd., Chairman |
| | Akira Ishii | Japan Oil, Gas and Metals National Corporation, Oil & Gas Business Environment Research Group Leader, Chief Economist |
| | Yasuhiro Goto | Nihon Keizai Shimbun, Inc., Editorial Writer |
| | Yoshihiko Sakanashi | EPDC., Ltd., Executive Director |
| | Tatsujiro Suzuki | Central Research Institute of Electric Power Industry, Research Fellow |
| | Shigeru Sudo | International Development Center of Japan, Energy and Environment Program, Senior Analyst |
| | Akihiko Tanaka | University of Tokyo Institute of Oriental Culture, Director |
| | Katsutoshi Chikudate | Tokyo Electric Power Company, Executive Vice President |
| | Masahisa Naito | The Institute of Energy Economics, Japan, Chairman & CEO |
| | Naoto Hashimoto | Nomura Securities Co., Ltd., Senior Analyst, IB Strategic Research Department |
| | Yoshiki Hatanaka | International Development Center of Japan, Energy and Environment Program, Director |
| | Shigeo Hirai | Nippon Oil Corporation, Senior Vice President |
| | Tadaaki Maeda | Tokyo Gas Co., Ltd., Executive Vice President |
| | Yukio Masuda | Mitsubishi Corporation, Senior Executive Vice President |
| | Masayuki Yamauchi | University of Tokyo Graduate School of Arts and Sciences, Professor |
| | Atsushi Yamamoto | Mizuho Research Institute, Ltd., Economic Research Department, Senior Economist |

## □Energy Security Study Working Group Members

| | | |
|---|---|---|
| Leader | Shigeru Sudo | International Development Center of Japan, Energy and Environment Program, Senior Analyst |
| | Nobuo Aoki | Tokyo Electric Power Company, Corporate Planning Department, Deputy General Manager |
| | Akira Ishii | Japan Oil, Gas and Metals National Corporation, Oil & Gas Business Environment Research Group Leader, Chief Economist |
| | Takuya Inohira | EPDC, Ltd., Energy Business Department, Planning Group Leader |
| | Yutaka Kunigo | Tokyo Gas Co., Ltd., Gas Resources Department, General Manager |
| | Ken Koyama | The Institute of Energy Economics, Japan, Senior Research Fellow |
| | Tatsujiro Suzuki | Central Research Institute of Electric Power Industry, Research Fellow |
| | Keisuke Tomoda | Mitsubishi Corporation, Corporate Strategy & Research Department, Economic Research Team Manager |
| | Shingo Nishimura | Nippon Oil Corporation, Corporate Planning & Management Department, Group Manager |
| | Naoto Hashimoto | Nomura Securities Co., Ltd., Senior Analyst, IB Strategic Research Department |
| | Yoshiki Hatanaka | International Development Center of Japan, Energy and Environment Program, Director |

# Research Timeline

| Research Council | Working Group |
|---|---|
| **1st Meeting (December 22)**<br>・ Goals of the Study Group and recent affairs related to energy security | |
| **2nd Meeting (February 1)**<br>・ Organization of points of 1st meeting<br>・ Report of 1st WG meeting proceedings<br>・ Introduction of scenario planning case studies (“Two Chinas” Omori, JST)<br>・ Risk evaluation and evaluation of response measures (including concrete action plan) | **1st WG (January 20)**<br>・ Brain-storming about identifying and evaluating risks (Workshop 1) |
| **3rd Meeting (March 6)**<br>・ Organization of points of 2nd meeting<br>・ Report of 2nd and 3rd WG meeting proceedings<br>・ Presentations by key figures on response measures<br>・ Evaluation of response measures based on risk evaluations (including concrete action plan) | **2nd WG (February 10)**<br>・ Brain-storming about response measures and strategy options based on risk evaluations (Workshop 2) |
| **4th Meeting (March 27)**<br>・ Report of 3rd WG meeting proceedings<br>・ Organization of main points | **3rd WG (March 14)**<br>・ Organization of main points with consideration to research council findings |
| Research status report at the Natural Resources and Energy General Research Council (Oil Strategy Sub-Committee (April 3)) | |
| | **4th WG (April 5)**<br>• Concrete organization and evaluation of response measures with consideration to study group findings |
| Research status report at the Natural Resources and Energy General Research Council (general council meeting (April 12)) | |
| **5th Meeting (April 25)**<br>・ About interim report | **5th WG (May 10)**<br>• About interim report |
| **6th Meeting (June 5)**<br>・ About interim report | |