

## **Energy Security and Nuclear Energy<sup>1</sup>**

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### **Introduction**

Thank you Mr. Chairman for your kind introduction.

Ladies and gentlemen, it is a pleasure to be invited to contribute to this session of panel discussion on Energy Security and Nuclear Energy.

As energy is essential to improve the quality of life and opportunities in a country, it is an obligation of any government to ensure for the people sufficient, reliable and environmentally responsible supplies of energy at prices reflecting market fundamentals.

The world today is, however, full of challenges to this obligation, such as depletion of oil and gas resources, rapid increase in the demand for energy in countries such as China and India, unpredictability of energy market, growing geopolitical risks, security of energy infrastructure including transportation, existence of large scale energy poverty, and need for significant reduction of CO<sub>2</sub> emissions to counter global warming.

These challenges have a crucial bearing on the survival of countries that are poor in energy resources like Japan as an independent country. This is why the Ministry of Economy, Trade and Industry (METI) of Japan last year published the new national energy strategy of which goals are to enhance energy security, assure sustainable economic development, and coordinate international efforts for overcoming global energy problems.

In the following, first, I will analyze such challenges a little more in detail and then I will summarize the salient points of the new national energy strategy, including the objectives to be pursued for nuclear energy to play the role assigned in the strategy.

### **Emerging challenges: energy security is a global issue**

**Paradigm shift in energy policy:** Since the mid-1980s, due to such factors as a prolonged oil glut and low crude oil prices, the US and Europe gradually came to view energy market as little more than a commodity market, and believed that only a bare minimum of energy related policies were required for the assurance of supply. This view then spread to Japan in 1990s.

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However, the terrorist attacks that occurred in the United States on September 11, 2001, brought about a shift of paradigm for the design of energy policy. A strong awareness has developed of the importance of ensuring national and individual security, bringing with it a need for a fundamental change in the energy policy strategies from those that emphasize the pursuit of economic efficiency and equity to those that emphasize the pursuit of energy security.

This paradigm shift has been accelerated by the recent soaring in the crude oil price. This rise in the oil price can be seen as a result of multiple causes such as the major growth in oil demand by the world, driven particularly by the demand of the nations of large population and high economic growth like China and India; significant decreases in the reserve capacities at the crude oil production and refining facilities in the world; and concerns about supply interruption that could possibly occur from terrorism and conflict in countries like Iraq and Nigeria or from issues around the Iranian nuclear activities.

Of course, it is quite logical for countries like China to make all efforts to develop domestic energy resources, diversify the source of energy supplies, and invest in upstream development in other resourceful countries. From the view point of globalization of energy market, it can be said that such efforts to increase international investment and trade may contribute to the stability of the market.

It should be kept in mind, however, that if such actions are excessively exclusive due to blind pursuit of national energy security, the stability of international energy market will be damaged by the friction and tension among consumers. This alarm can be also applied to the supply side as the stability of the market will be damaged if actions of big suppliers are excessively driven by narrow national interest. The conflict between Russia and the Ukraine from late 2005 to early 2006 which included the stop of the supply of natural gas is still fresh in our memory. It should be kept in mind also that the possibility of a gas cartel in future cannot be entirely ruled out.

**Geopolitical risks:** Today's international energy market is exposed to higher geopolitical risks. The most important one is the emergence of various factors for instability in the Middle East that holds the largest oil reserves in the world. Included in such factors are: uncertainty about the Iraqi situation; the spread and rampage of terrorism; uncertainty about the future of Middle East peace-making efforts; growing tension between Iran and Western countries concerning Iran's nuclear development program. It must be noted that underlying factors for terrorism are becoming more complicated with the passage of time and that terrorism is no longer an issue in the Middle-East only, but becomes a common threat throughout the world.

**Security of energy infrastructure including transportation:** Vulnerability of critical energy infrastructure is becoming a matter for great concern. We have already observed the impact of hurricanes on the fuel supply in the US. In terms of transportation capacity, a recent focus is on the safety of transportation through the Strait of Malacca. Already a large number of oil and LNG tankers and other vessels pass through the Strait of

Malacca and the International Energy Agency expects that the passage of tankers will double by 2030. Therefore the risk of supply interruption that might result from accident or terrorist attack there, as well as the risk of environmental pollution thereof would rise significantly if relevant measures are not taken to prevent their occurrences.

**Delay of investment:** Ensuring the supply of energy requires the adequate capacity along the entire supply chain. This is true not only with oil but also with natural gas and electricity, for which the development of infrastructure such as pipelines and grids is as important as the development of production facilities. However, investments for building an extensive and/or large-scale installation such as those and nuclear power plant are becoming difficult due to the difficulty in finding a place to locate the facility owing to the NIMBY (Not-In-My-Back-Yard) syndrome in developed countries and/or due to uncertainty in the evolution of environmental regulations. In addition, since energy market liberalization brings about the uncertainty of economic competitiveness in the future, energy companies are becoming more cautious about all kinds of investment. The resulting tendency to minimize the reserve capacity in energy supply will make it difficult to secure the energy supply capacity that may be judged necessary and sufficient from the point of view of energy security.

**International politics on the measures against global warming:** As the Kyoto Protocol took effect in February, 2005 when it was ratified by the countries listed in Annex B of the protocol including Russia, those countries are now formally obliged to control their emissions of greenhouse gases. Accordingly, what goals should be addressed in the post-Kyoto period to cope with long-term challenges as new global environmental order, as well as how to attain the limit set for the First Commitment Period of the Protocol is becoming pressing issues in international as well as domestic policy debates on energy and environment in these days.

It is inevitable that international negotiations on environmental issues and those on the subject of measures against global warming, in particular, take place in the arena of international politics where national interests collide and discussions proceed with national interests at stake. That said, however, it is important to make efforts to involve major economies in the commitment as such a global problem cannot be dealt with exclusively by means of localized approaches. In addition, it should be taken into consideration of new environmental order that the timeline for implementation of the Kyoto Protocol is too brief and prevents many countries from planning necessary investments in new infrastructure and technologies in an efficient manner.

### **Japan's Actions towards Strengthened International Energy Security**

In order to achieve both enhancement of energy security and sustainable development, Japan has made it clear at the occasion of recent G8 summit that Japan would, in cooperation with other countries, 1) make the most of Japanese technologies and know-how on energy saving and clean energies, 2) pursue harmonization of resource use and environmental conservation, such as 3R's Initiative, namely, Reduce, Reuse and Recycle Initiative; and 3) stabilize energy supply through international coordination.

One of the concrete action plans prepared along the lines to pursue these strategic policy objectives is the New National Energy Strategy announced by the Ministry of Economy, Trade and Industry (METI) June last year. Overall objectives of the strategy are

- (1) to establish an advanced energy supply-demand relation by improving energy efficiency and diversifying energy sources and technologies, identifying promotion of nuclear energy as the basis for the strategy;
- (2) to establish a foundation for sustainable development through a comprehensive approach to solve both energy issues and environmental issues as a set, by improving relation with resource producing countries, coordinating energy policy among Asian countries, encouraging overseas investment for exploration and production of energy resources, and contributing to the resolution of international issues related with security of energy supply with the recognition that energy security is neither a prerogative nor an objective of any country and must be approached as a global issue;
- (3) to enhance the emergency preparedness of stockpiles of oil by innovating its efficiency, safety and readiness.

The strategy sets forth five specific numerical targets to be achieved by 2030 as a kind of milestones for attaining the overall objectives in a longer framework of time.

- (1) Target of energy conservation: the energy consumption per unit of GDP should be improved by 30%.
- (2) Target of reducing oil dependence: the dependency on oil as a percentage of the total primary energy supply should be reduced to 40% or less from the present level of a little less than 50%.
- (3) Target of reducing oil dependence in the transport sector: the percentage oil dependence in the transport sector should be reduced to around 80% from the present level of almost 100%.
- (4) Target of overseas natural resources development: the percentage of equity oil secured by Japanese companies in the total supply of imported oil should be increased to 40% from the present level of 15%.
- (5) Target on nuclear power generation: the share of electricity generated by nuclear power plants in the total electricity generation should be increased to the level of 30 to 40% or more.

In order to arrive at these milestones, it is important to pursue breakthrough in various pinch points of the technologies and systems on the one hand and strengthen strategic collaboration between the government and private organizations as well as government-wide efforts to strengthen the scheme of promoting relevant policies.

The new strategy is therefore composed of four sets of plans in specific areas each of which was prepared through intensive negotiation among relevant organizations. The first set is those for realizing the state-of-the art energy supply-demand structure and composed of a) Plan of Energy Conservation Frontrunner, b) Plan for Next Generation Transport Energy, c) Plan for Innovation of New Energy, and d) Nuclear Energy

National Plan. The second set is those for comprehensively strengthening resource diplomacy and international cooperation in the energy and environmental policies and composed of a) Comprehensive Strategy for Securing Resources and b) Strategy for Energy and Environment Cooperation in Asia. The third is Plan for Enhancement of Emergency Preparedness, and the fourth is Energy Technology Strategy as a common action plan for the Strategy as a whole.

### **The Nuclear Energy National Plan**

As already mentioned, the Strategy identifies the promotion of nuclear energy as the basis for the energy policy since Japan believes that the use of safe and secure nuclear energy will contribute to energy security, while simultaneously reducing harmful air pollution and addressing the climate change challenge. Currently, 55 units are in operation: 3 units are under construction and 11 units are at planning stage. These operating units as a whole has supplied about 30% of total electricity generated and improved self-sufficiency ratio of energy from 4% to 16% in 2005.

The Nuclear Energy National Plan is the result of deliberation about concrete actions for implementing the following three basic policy goals of the Framework for Nuclear Energy Policy decided by the Atomic Energy Commission in 2005:

- (1) Continue to meet at least 30-40% of Japan's total electric power generation requirement even after 2030:
- (2) Adopt reprocessing of spent fuel and effective utilization of recovered plutonium, uranium, and other elements: and
- (3) Target commercial use of fast breeder reactors (FBRs), to begin around 2050 on the premise that they meet the necessary conditions, including economic viability.

By analyzing ways to pursue these basic goals, the Nuclear Energy National Plan presents the following strategic goals and concrete actions for achieving each of them:

- (1) Induce the investment to construct new nuclear power plants and replace existing reactors in an era of electricity market deregulation:
- (2) Utilize existing nuclear power plants as efficiently as possible, with ensuring safety as a key prerequisite:
- (3) Promote activities of nuclear fuel cycle steadily and reinforce nuclear fuel cycle industries:
- (4) Commercialize an FBR and its fuel cycle as soon as practicable:
- (5) Maintain and develop human resources and technology basis for industries:
- (6) Support international deployment of Japan's nuclear power industry:
- (7) Participate in the creation of an international framework for assuring nuclear non-proliferation as well as expansion of nuclear power generation:
- (8) Build up trust between the government and local communities in which nuclear facilities are located by means of detailed communication, convening of comprehensive hearing, and promoting awareness:
- (9) Promote steadily the operation of radioactive waste disposal facilities.

## **Conclusion**

Energy security is an important issue. Various actions including that for diversifying the energy mix should be taken. To diversify the energy mix, we should work to make wider use of nuclear and renewable energy. Japan has chosen the use of safe and secure nuclear energy for energy security and addressing the climate change challenge.

The New National Energy Strategy and Nuclear Energy National Plan are designed, taken these into consideration, to promote the use of nuclear energy steadily, while aiming at further reduction of the risks associated with the use of nuclear energy and continuing to develop innovative nuclear power systems as an important element for efficient and safe nuclear energy systems for future, in cooperation with countries that have or are considering plans to do so.