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## **Visions for the Global Nuclear Industry in the 21<sup>st</sup> Century – a Japanese View**

Toshiaki Enomoto

First of all, let me congratulate the WNA Chairman, Agneta Rising, and her staff, as well as all the WNA members, for bringing about this Inaugural Symposium.

I feel very privileged to speak in this keynote session this morning along with such distinguished guests, and I am very happy to talk about my perspective on how we should proceed with nuclear power in my country, particularly in light of the unique situation in Japan.

### **Energy in Japan**

As most of you know, Japan has very little of its own energy resources, and our dependence on imported energy amounts to 80%, ranking second among the nations in the world. Speaking of oil, it is even worse and very close to 100%. Moreover, Japan is an island nation, situated on the east end of an Asia rather short of energy resources, and cannot be easily connected to other countries through pipelines or electricity grids.

Thus, securing reliable energy resources has always been an important issue for us. It has been Japan's policy to avoid excess reliance on any one specific resource, especially on oil. Although our dependence on oil is still high at around 50 % of primary energy, we have been trying to replace oil with diversified resources such as nuclear, gas and coal, thus achieving a balanced supply system.

In terms of generating capacity, coal's share is about 10%, and the other resources are around 20 to 25% respectively. So I think that our supply system is now well balanced.

### **Electricity demand and nuclear power**

Looking at the growth in electricity demand and nuclear generating capacity in recent years in Japan, it is easy to understand how positive we have been in developing nuclear power in the past.

Between 1990 and 2000, nuclear power capacity has increased from about 31GWe to 45GWe. This increase in capacity provided 60% of the increment in generated power during this period, and the nuclear share in kWh has increased from 27% to 34%. As a result, nuclear has grown so as to provide 16 % of primary energy as of 2000, which is globally the second highest, following France.

### **The necessity of nuclear power in terms of energy security**

In the Kyoto Protocol, Japan set a target of reducing greenhouse gasses by 6% compared to the 1990 level. The target will be possible by the construction of an additional 20 nuclear power reactors by 2010, thus increasing nuclear generating capacity to 70GWe from the present level of 45GWe. However, around 13 reactors may be a more realistic figure if we consider siting problems.

Thus, it may be asked whether the nuclear fuel business will be stagnant in Japan for a certain period of time. My answer is no. An additional 13 reactors will provide us with a 38% increase in nuclear capacity. And we will improve the utilization factor by 10% from the current 80-84% level through various methods, such as reducing unplanned shutdowns, shortening maintenance outages, extending operating cycles, and power upratings. To do this, we will need about 50% more fuel by 2010. Annual growth of fuel consumption is twice or three times greater than that of Japan's GDP.

Although it is not likely that fossil fuel resources will dry up in near future, it is still conceivable that some regional conflict in the near future may bring about a temporary price surge or interruption in the supply market for fossil fuels. In the longer term, economic growth in developing countries will inflate world energy demand, which will result in a chronic rise in fossil fuel prices. In addition, some regulation may be imposed on the use of fossil fuel in the future from a global environmental perspective.

As most of you will agree, nuclear power is an energy source which is very effective from an energy security point of view. Uranium is distributed among politically stable countries and stockpiled in various front-end processing facilities as well as in nuclear power reactors. It has the potential to breed itself to an order of tens of times through the application of plutonium recycling.

Thus, I believe that nuclear power has to, and will, be a major player in electricity generation in our country in the future.

### **Policy challenges**

However, the near future, the coming ten years or so, will not be so positive for nuclear power in Japan as it has been in the past.

A partial deregulation in the Japanese electricity market started in March 2000. There are arguments that utilities in a deregulated environment will choose more economic coal and gas over nuclear, because nuclear will need a large initial capital investment. However, we will maintain the cost competitiveness of nuclear by achieving cost reductions and by improving utilization factors, as I mentioned before. The safe operation of nuclear power plants is our biggest task, but we must achieve safe and cost competitive operation at the same time.

It has been our national policy to promote the development of nuclear power generation and the establishment of the nuclear fuel cycle, and this was reconfirmed in our government's latest *Long-Term Program for Nuclear Energy*, which regards nuclear power as a mainstay among energy sources. However, during the last several years, some conflicts have evolved between national and regional interests. In other words, the central government's policy is being challenged more often than previously by local governments, as part of a broader process of decentralization.

For example, the loading of MOX fuel in light water reactors, which has become everyday business in some parts of Europe, is being held back in our country because of opposition by local governments and the negative outcome of a referendum. According to media analysis, large portions of local residents who have voted against MOX in Kariwa Village were uneasy about safety. I believe this uneasiness was inspired by the FBR "Monju" accident and the JCO criticality accident.

We have repeatedly explained safety issues to local residents in both power producing and consuming regions. However, our efforts have been substantially spoiled by the strong anti-nuclear activity by local residents against agitating against the use of MOX fuel.

It is difficult to overcome these sentiments once residents have been influenced by them. From our recent experience, I believe that it is necessary for pro-nuclear organizations like ourselves to communicate closely among ourselves and to hold in common not only favourable information, but also that which is negative or inconvenient. We must get ahead of the anti-nuclear movement. We must deliver at an early stage accurate information, and clearly explain the significance of any incident from the safety standpoint of safety. By these efforts, I believe that we can prevent the general public from being unduly influenced by actions of the anti-nuclear movement.

I would like to conclude by expressing my hope that the support of these activities will be one of the biggest mandates for WNA.

Thank you very much for your attention.