Actions Necessary to Promote Nuclear Energy Utilization for Solving Global Problems We Face[1]

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Thank you Dr. Wieninger for kind introduction and I want to thank also the Organizer of this conference for inviting me to this session.

I would like to discuss about actions necessary to promote nuclear energy utilization in the world as a means to rise to the challenge of energy security and climate change with which our global society is confronting.

Major developed countries including Japan have already expressed their commitment to the reduction of greenhouse-gas emissions to 50% of the current level in the first half of this century. This means that the annual global carbon-dioxide emissions in 2050 must be 13 Gt Carbon/yr below that predicted in the business-as-usual case.

It is predicted that the global demand for energy will surely continue to significantly increase since countries everywhere seek to eradicate poverty and improve a living standard of the people, it is required for global society to pursue the increase in energy supply based on low carbon technologies such as nuclear energy and renewable energies.

It is reasonable for the global nuclear community therefore to have a vision that nuclear energy will contribute in many parts of the world as one of the mainstay technologies for electricity and heat generation to foster economic growth, energy security and a low carbon economy simultaneously.

The capacity of global nuclear power generation at present is about 370GWe and it supplied about 16% of electricity globally generated in 2007. In recent years its share has stagnated and even fallen slightly due to more rapid development of electricity generation all over the world. In the case of Japan, 54 units of which

[1] Presented at the second “Pacific Rim Security – Managing the Global Commons” Conference, 22-24 February 2010, Stanford University, Palo Alto, California, USA.

total capacity is about 49GWe are in operation and 5 more units are under construction or licensing review process.

Even if we global community decides to avoid 1.3Gt Carbon/yr or just one-tenth of the avoidance target in 2050 by expanding the nuclear capacity, it is necessary to replace 900GWe coal-fired power plants with nuclear power plants. This means that global nuclear power capacity should increase to 1400GWe by 2050. By chance, this 1400GWe is roughly equal to the capacity OECD Nuclear Energy Agency found to be reached in 2050 under its high scenario.

Clearly to reach this level would require mobilizing much greater industrial, human and financial resources than currently exist within nuclear and related industries. But at this occasion I would like to stress that it is important, in order to build a sense of what may be achievable, that global nuclear community should energetically act for;

- Sustaining safe and efficient operation of existing nuclear power plants, steadily installing new plants and managing used-fuel and radioactive waste in appropriate manners,
- Shaping environment for facilitating the peaceful uses of nuclear energy in every part of the world, and
- Promoting R&D activities to realize competitive and sustainable nuclear energy technologies.

In the following, I will like to elaborate actions to pursue the first two goals, considering the theme of the session.

First, in order to successfully continue to operate the fleet of nuclear power plants and steadily install new capacity that is necessary to satisfy the need for energy; the AEC asks nuclear community to work hard among others to;

a) Maintain the public trust in both the plant operator’s management and the effectiveness of regulatory activities for nuclear safety, security and nonproliferation, promoting open and transparent risk communication with the public unremittingly; and
b) Make it possible to deliver safe management and disposal of used fuel and radioactive wastes.

The management of used fuel and disposal of high level radioactive waste remain key challenges in many countries. The delay or failure thus far of some disposal facility programs for used fuel or high level radioactive waste continues to have a significant negative impact on the image of nuclear energy.

Looking back over the past, we should have made it a common understanding with the public that it is an excellent interim solution to safely store the used fuel beside the nuclear power plants for more than 50 years, making the used fuel reprocessing a global nuclear community's concerted action to jointly explore the best way to go in the future.

However that may be, progress is being made in some countries and in Finland the selected site has received political and local support, although so far no repositories for disposal of high-level waste have been licensed yet. I agree, though, with the claim that the Waste Isolation Pilot Project (WIPP) repository for transuranic radioactive waste at Carlsbad in New Mexico.

The second goal is to shape the environment for promoting the peaceful use of nuclear energy everywhere in the world. To pursue this goal the global nuclear community should work hard to;

a) Build a global consensus that nuclear energy is an essential measure against global warming;
b) Internationally support countries considering the introduction of nuclear power; and
c) Strengthen the international system for ensuring nuclear safety, security and nonproliferation.

As for global consensus on nuclear energy, the global nuclear community is seeking the recognition of nuclear energy as an activity for the clean development mechanism project in the post-Kyoto Protocol framework currently under deliberation, and asking international financial organizations such as the World Bank to catalyze the investment in the construction of nuclear power plants in developing countries and those to be used for both electricity generation and water desalination, in particular.

Undertaking a nuclear programme is a major commitment requiring strict attention to nuclear safety and the control of nuclear material. This commitment

is not only a responsibility to the citizens of the country developing such a programme, but also a responsibility to the international community. Therefore it is also important for global nuclear community to, first of all, actively support the IAEA so that it can strengthen its human and financial resources to help such countries work systematically towards the introduction of nuclear power through objective reviews and assistance activities, utilizing the IAEA's milestone document that specify the way to build the national infrastructure for nuclear power utilization that is composed of human resources, legal frameworks in compliance with international legal instruments based on the internationally accepted nuclear safety standards and security guidelines, institutional as well as technical arrangements to accept the activities related with the IAEA safeguards and the Additional Protocol (AP) and so on.

At the same time, developed countries should also promote direct collaboration with such countries to facilitate their nuclear infrastructure development through dialogue, consultation and joint activities, recognizing that human resource development, financing, access to the technology and the latest research, and promotion of stakeholder engagement are central issues that need assistance from the international community.

Lastly, I would like to point out that it is one of the duties of global nuclear fuel cycle service providers to maintain the competitive situation of the market so that buyers can enjoy the supply of service at competitive pricing.

The international nuclear market has expanded to the point that all front-end services including enrichment may be confidently purchased and it is not necessary for new comers to develop a national fuel cycle infrastructure. As for used fuel, it is highly likely that interim storage for several decades will be chosen by most operators as technologies for such storage are mature and available anywhere in the world.

The fact is that enrichment and reprocessing facilities involve technologies that are sensitive from the point of view of proliferation, on the one hand, and do not provide attractive rate of return unless they are very large scale. Owing to this fact, these fuel cycle services have been provided by a limited number of large-scale suppliers who are competing due to the slow growth of the market and ambitious investment for increasing supply capacity for future. Nuclear power plant operators are, on the other hand, enjoying the buyer's market

situation, often practicing strategies that incorporate inventory, diversity of supply and contractual flexibilities.

Therefore global community should ask fuel cycle service providers to make effort for sustaining current buyers' market situation so that any country will not choose to develop their own sensitive fuel cycle technologies. Needless to say, such action does not make international initiatives for nuclear fuel assurance currently being proposed and promoted as a back-up last resort solution of little use, since they will provide further assurance of fuel supply at competitive pricing.

Then what should be the future of this service. In this consideration we should keep it in mind that global community with 1500GWe Light Water Reactors, which corresponds to the high scenario of the IECD NEA projection, will need only 10 enrichment plants each of which capacity is the maximum of current plants and 10 reprocessing plants each of which capacity is 1.5 times the maximum of current reprocessing plants. Accordingly I believe it quite rational for global nuclear community to pursue making these 10 plus 10 large scale plants regional centers for enrichment and reprocessing services under multilateral control. Why this is rational. This is because the community can enjoy the scale merit collectively and the framework is consistent with the norm of nuclear weapon free world, in which no one country is happy with the situation that neighboring countries are operating an enrichment plant and/or a reprocessing plant even if they are under the IAEA's safeguards.

This concludes my talk. Thank you for your attention.