

**An Overview of  
Japan's Nuclear Energy Policy  
- Current Status and Challenges -**

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# Nuclear Energy Utilization in Japan

- 55 LWRs operated by ten electric power companies supply about 30% of electricity and contribute to the increase in Japan's energy self-supply ratio from 4 % to 18 %.
- 3 units are under construction and 3 applications to construction permit are in the final stage of regulatory review.
- Electric utilities have announced that they will start construction of 7 more plants in ten years or so.

# Objectives of Nuclear Energy Policy

- **The AEC's Framework of Nuclear Energy Policy:** a basic policy for the Government to promote research, development and utilization of nuclear energy. It aims at:
  - making the share of nuclear power in electricity generation after the year 2030 similar to or greater than the current level of 30 to 40 %.
  - Utilizing fissile material recovered from spent fuel through its reprocessing in LWRs for the time-being and disposing the high-level radioactive waste from reprocessing into geological disposal facilities.
  - Commercializing fast breeder reactors (FBRs) before 2050 for better utilization of resource and possible reduction of heat generation rate of radioactive waste.in addition to wider utilization of radiation & radioactivity.

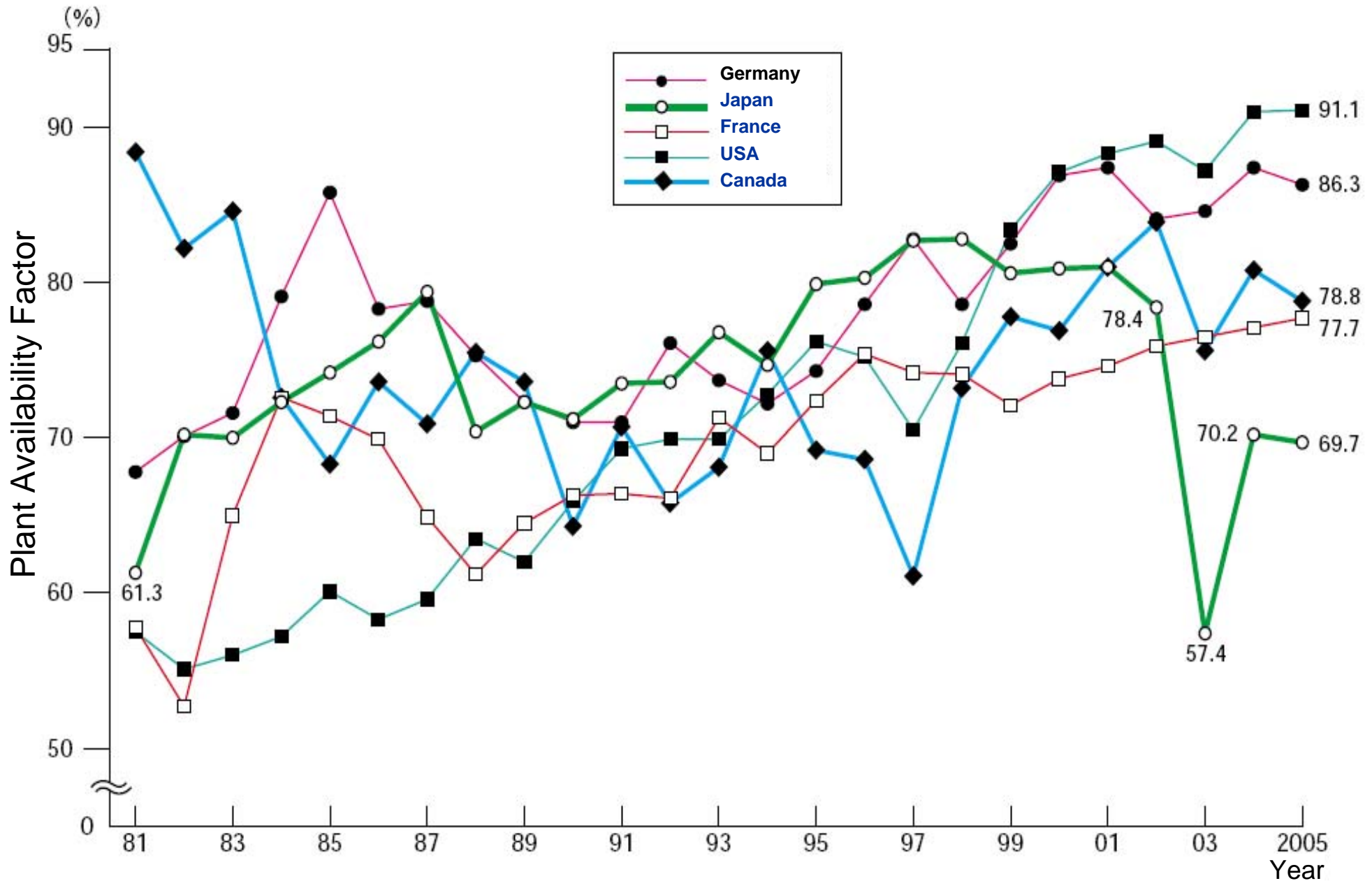
# Actions to maintain and strengthen the basis for nuclear energy utilization

- Assure strict limitation to peaceful purposes;
- Assure safety, security and safeguards of such activities;
- Maintain openness and transparency of decision making processes and assure public participation in them, providing the public formal and informal opportunities to learn what nuclear energy is;
- Nurture mutual understanding between central and local governments, considering that the acceptance of nuclear facilities by local governments are essential.
- Secure number and quality of talents for the activities;
- Promote the safe disposal of all categories of radioactive waste;
- Promote international cooperation and contribution.

# Siting of a HLW Disposal Facility

- In 2000, the AEC decided that activities related with the disposal should be promoted in an open and transparent way and the site of the disposal facilities should be determined based on the application from municipalities.
- In 2004, the NUMO, an organization authorized to promote the disposal activity, started to invite mayors of municipalities to apply to site suitability investigation.
- However, so far no mayor has successfully applied: even the announcement of a mayor to study the merit and demerit of the application has paralyzed the administrative affairs of the municipal office due to the intense media attention and rallies and demonstrations to protest the announcement.

# Trend of Plant Availability Factor in Several Countries



Source: "Annual report on operation management of nuclear facilities" etc

# Low Plant Availability: Why

- Lengthy communication between local government and operator was necessary before the government agrees to restart the plant after an incident, especially in the case where cover-up action of the operator was identified in relation to the incident or a new regulatory position on the repair work had not been understood beforehand by the local government.
- The frequency of legal periodic plant inspection has been prescribed as once in 13 months: prepared is a new system in which plant specific meticulous legal inspection will be down at every 13 or 18 or 24 months depending upon the plant condition.
- Onagawa, Shika and Kashiwazaki-Kariwa NPPs experienced a seismic motion exceeding the design-basis seismic input. For their restart, operators were required to submit the report on the integrity of the plant and the re-evaluation of seismic safety, choosing a higher reference seismic input.

# The 16 July 2007 Earthquake at Kashiwazaki-Kariwa NPP of TEPCO

- The seismic input to the plant significantly exceeded the level of design basis seismic input of the plant. The cause of the excess was identified recently as the complex geological structure around the site, which was not reflected on the distance attenuation formula widely used in the past for the estimation of seismic input from nearby faults.
- Fortunately any significant damage of safety-related structures, systems and components (SSCs) of the plant has not been reported, whereas non-safety related SSCs were affected mainly by anchorage failures due to significant soil deformation as they were not connected to the bedrock.

# Nuclear Non-Proliferation

- Treaty on the Non-Proliferation of Nuclear Weapons: NPT came into effect in 1970. Japan ratified in 1976 and concluded the comprehensive safeguard agreement with the IAEA in 1977
- IAEA established NPT Additional Protocol (AP) in 1997 that allows the IAEA's complementary access to the facilities not included in the safeguard agreement. Japan accepted the protocol in 1999
- IAEA established Integrated Safeguards Conceptual Framework in 2002. It was applied to Japan from 2004 onwards based on the assessment of the CSA and AP performance by the IAEA.
- Japan has contributed to the Enhancement of Nuclear non-Proliferation, making extra-budgetary contributions to IAEA's projects, holding seminars on the AP
- Japan has contributed to make the Plutonium usage transparent, by establishing a system to report annually the inventory of separated Plutonium to the IAEA on the one hand and to suggest the electric utilities to voluntarily announce the plutonium usage plan annually.
- Participate in NSG and Japanese representatives in Vienna act as the point of contact.
- Japan has been a member of the Friends of CTBT and has operated several facilities of International Monitoring System (IMS) for CTBTO.

# Next-generation LWRs

- R&D of innovative LWRs that will be competitive in the social and economic conditions in 20-30 years, taking into account revolutionary changes in science and technology on the horizon, such as;
  - high burn-up fuel (initial enrichment  $>5\%$ ),
  - seismic isolation technology/ advanced construction technology,
  - advanced information technology for human friendliness and on-line inspection and maintenance for high plant availability,
- The project starts in 2008, aiming at the completion of basic design in 2015.

# International Cooperation

- The objectives of international cooperation :
  1. To shape environment for nuclear energy uses establishing international schemes for assuring nuclear safety, security and nonproliferation,
  2. To globally share knowledge for nuclear energy uses for the benefit of global community,
  3. To pursue mutual benefit with other countries for the effective and efficient promotion of nuclear energy use in Japan.
- Quite recently the AEC proposed that Japan should be active in establishing international environment for safe, secure and proliferation resistant utilization of nuclear energy in countries who desire so for combating climate change.

# Strengthen International Nuclear Nonproliferation Regime

- Induce countries to ratify the Additional Protocol to the IAEA Safeguards Agreement for its universalization.
- Contribute to the discussion about the establishment of multilateral frameworks for fuel supply assurance, including a so-called safety-net mechanism to back up the fuel supply market in the event of disruption due to non-commercial reasons.
  - Japan's proposal: the IAEA should act as an intermediary to mobilize pre-registered fuel supply capabilities (enrichment, fabrication and transport etc.) of member states in the event of supply disruption, treating the affected as a priority customer by the change of queuing order and compensating properly the customers suffered due to this happening.

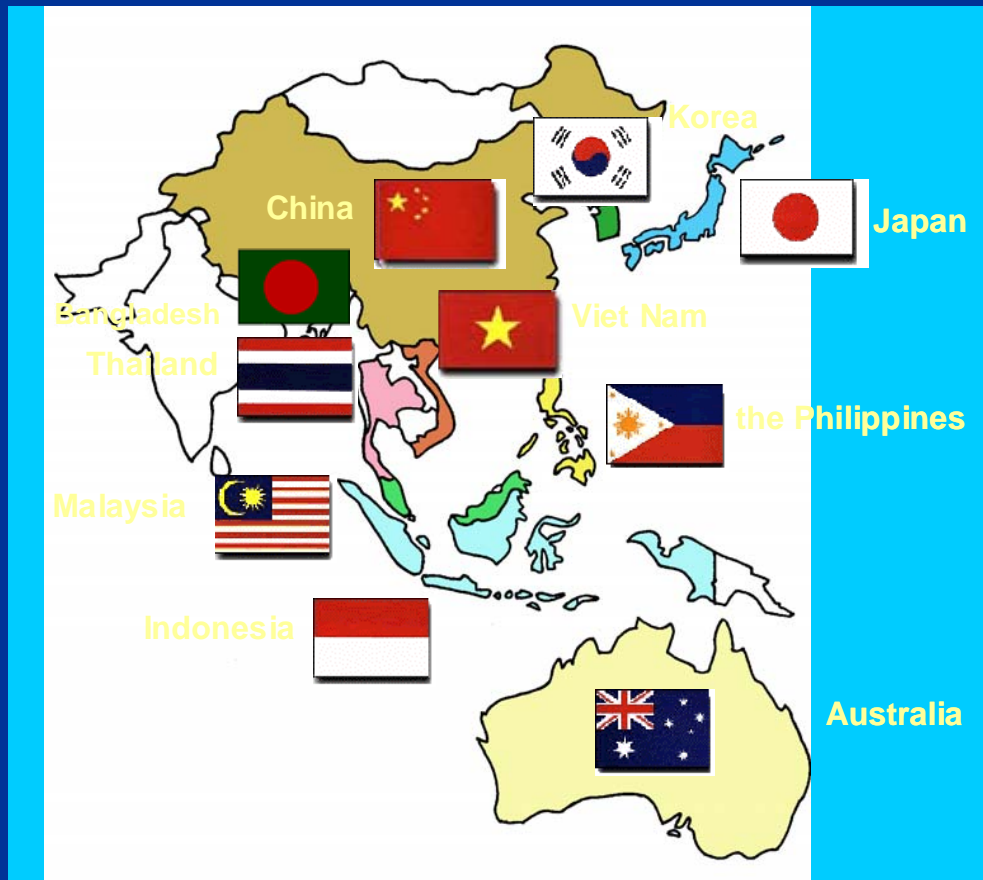
# Cooperation for Knowledge Sharing

- IAEA technical cooperation activities
- IAEA Regional Cooperative Agreement for Research, Development and Training
- Forum for Nuclear Cooperation in Asia (FNCA), which is a framework that promotes peaceful uses of nuclear energy in Asia, through voluntary cooperation among participating countries.

# FNCA (Forum for Nuclear Cooperation in Asia)

Australia, Bangladesh, China, Indonesia, Japan, Korea, Malaysia, the Philippines, Thailand, and Viet Nam  
(IAEA as observer)

From March 1999



## FNCA Vision Statement Mechanism

- for enhancing socioeconomic development
- through active regional partnership
- in the peaceful and safe utilization of nuclear technology

# Principal Actions Proposed by the AEC for Combating Climate Change

- Build a global consensus that the expansion of the peaceful use of nuclear energy is an essential measure against global warming, and develop international frameworks for the expansion.
- Reinforce international efforts, and the IAEA's efforts in particular, to ensure nuclear nonproliferation, safety and security.
- Positively cooperate in the efforts of various countries to build and strengthen infrastructure for peaceful use of nuclear energy.

**Thank you  
for your kind attention**