

# ***Nuclear Renaissance and Nuclear Non-Proliferation***

## ***Responsibilities of Nuclear Energy States and Japan's Contribution***

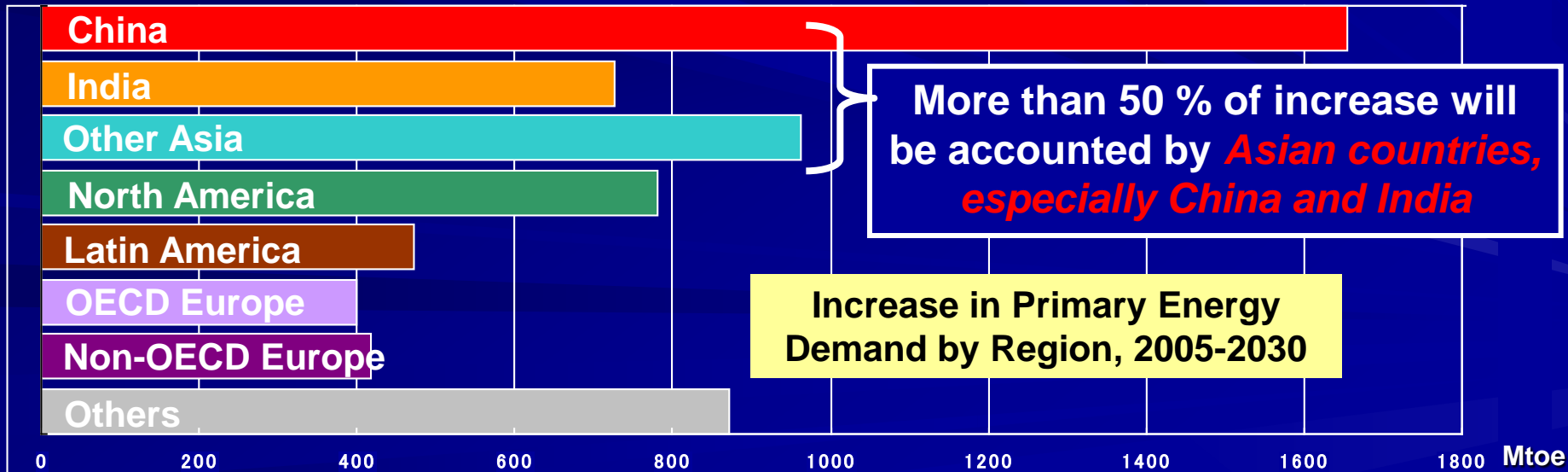
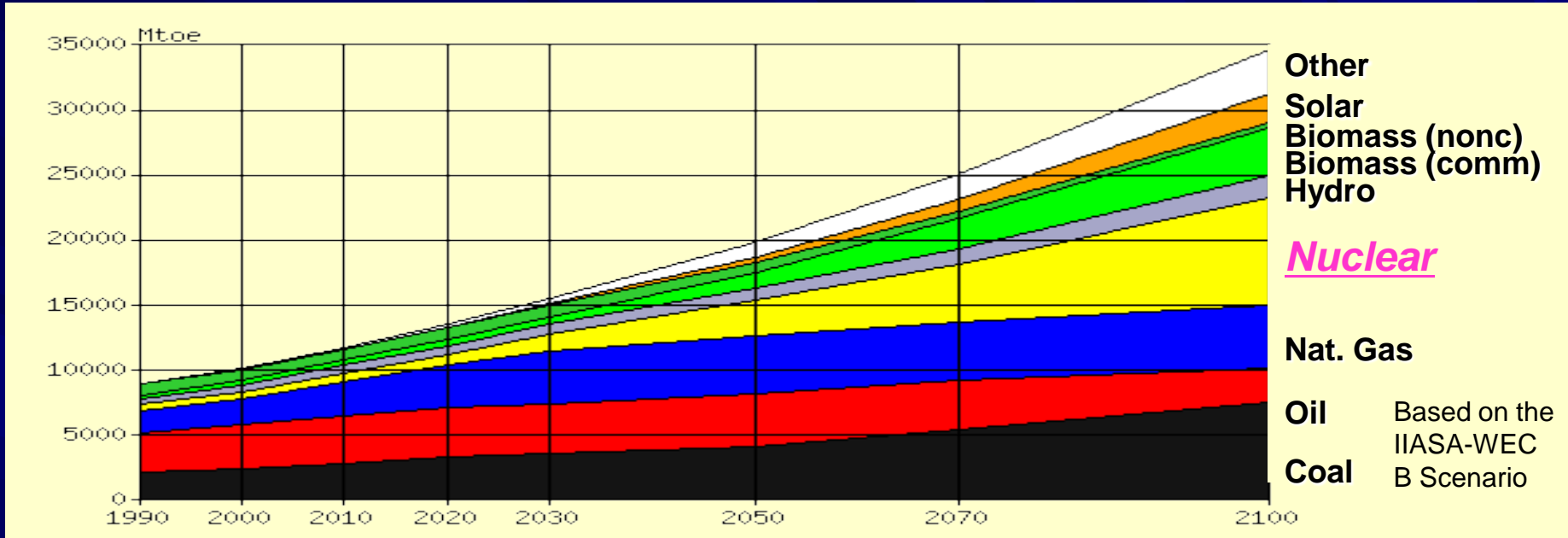
**2009 KINAC International Nuclear Nonproliferation Symposium  
22 October 2009, Seoul Plaza Hotel, ROK**



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**Nuclear Nonproliferation Science and Technology Center  
Japan Atomic Energy Agency (JAEA)**

# Projected Primary Energy Consumption by Fuel and Region



# The Background of Japan's Nuclear Energy Policy

## Energy Security:

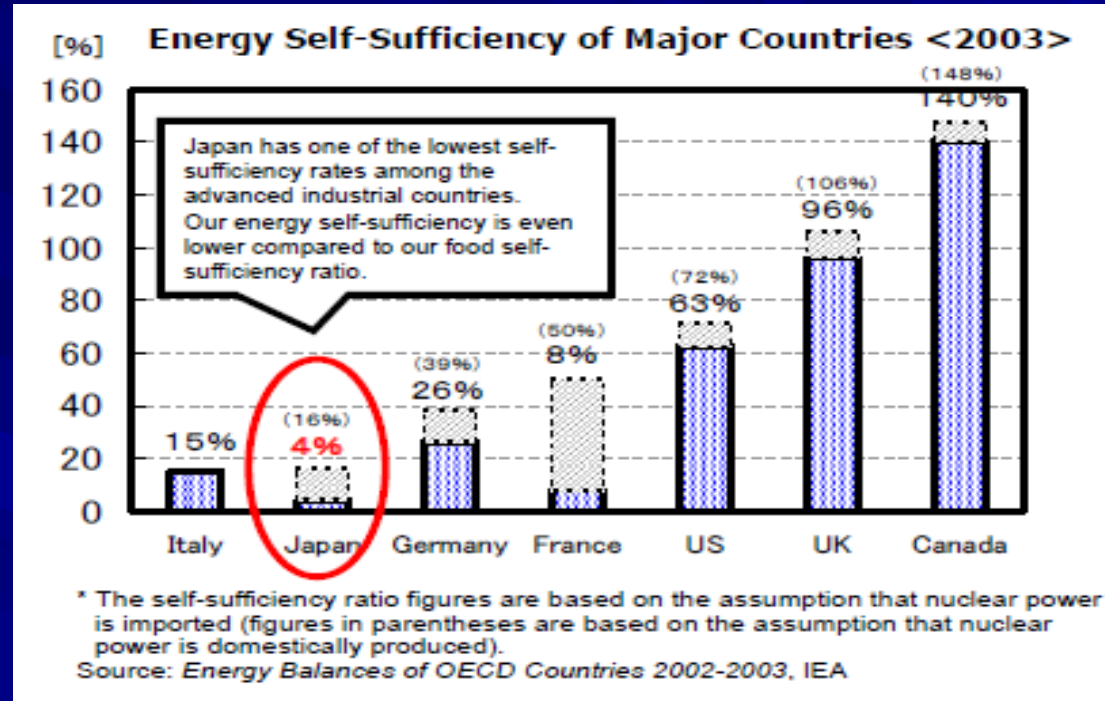
“Japan's energy self-sufficiency rate is 4 %”



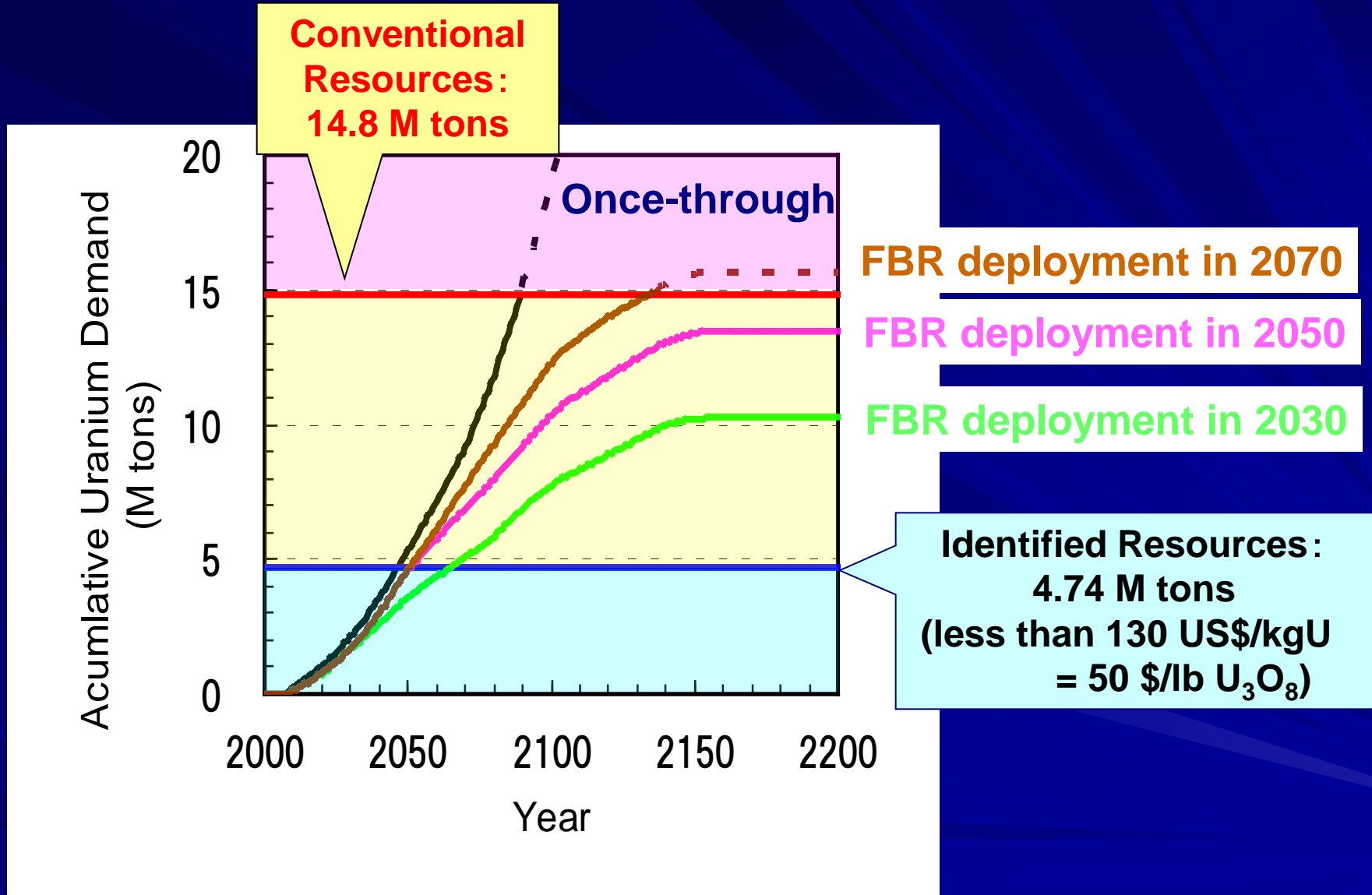
◆ The Utilization of Nuclear Energy as a Solution



Concerned about Climate Change



# Estimation of Global Uranium Demand



(Based on the **IIASA-WEC C2 Scenario**)

# Nuclear Energy Developments in Japan

*Japan is the only non nuclear-weapon state in the world with commercial scale nuclear fuel cycle facilities*



**Rokkasho Uranium Enrichment Plant (JNFL)**



**Rokkasho Reprocessing Plant (JNFL)**



**Tokai Plutonium Fuel Center (JAEA)**



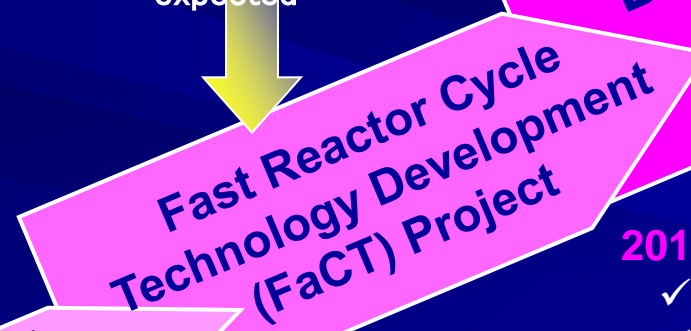
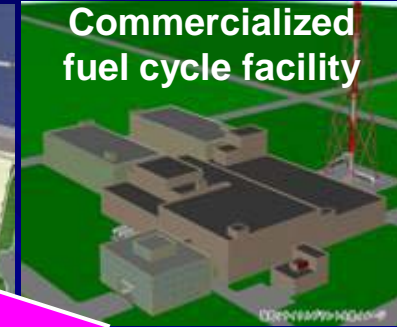
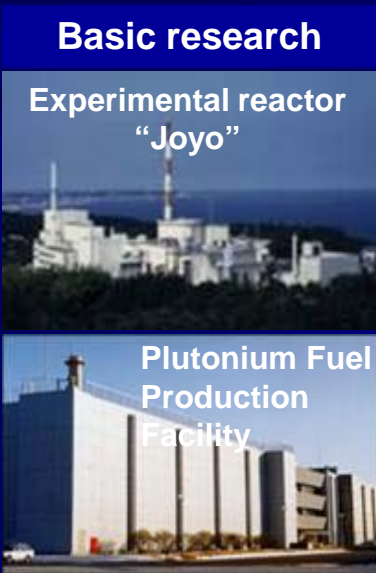
**53 Light Water Reactors  
(Total: 47.93 GWe)**



**Fast Breeder Reactor "Monju" (JAEA)**

# FBR Development Strategy in Japan

- ✓ Verification of operation reliability
- ✓ Establish sodium handling and innovative technology



**Before 2050**  
Development of commercialized FBR

**Around 2025**  
Demonstration reactor comes true for verification of economical competitiveness

- 2015**
- ✓ R&D plan for commercialization
  - ✓ Conceptual design of economically competitive FBR

- FaCT Project**
- ✓ Study on conceptual design
  - ✓ Development of innovative technology

- Feasibility Study**
- ✓ R&D on feasibility of candidate concepts
  - ✓ Clarification on candidate concepts

**1999**

**2006**

# Japan's Efforts for the Peaceful Use of Nuclear Energy

## *Five Key Factors for International Confidence*

- Manifestos for peaceful use of nuclear energy and total elimination of nuclear weapons
- Obvious Needs for nuclear fuel cycle program
- Transparency of national nuclear energy program
- Excellent Records of Compliance with non-proliferation norms for more than 30 years
- Active Contribution to Non-Proliferation



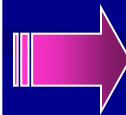
# Japan's Excellent Record of Compliance with Non-Proliferation Norms

## *Full Compliance with IAEA Safeguards*

- 1976: **Nuclear Non-Proliferation Treaty**
- 1977: **Comprehensive Safeguards Agreement**
- 1999: **Additional Protocol**
- 2004: **Broader Conclusion** ⇒ **Integrated Safeguards**
- **2008: Introduction of the Integrated Safeguards Approach Handling Plutonium for the JNC-1**

### Integrated Safeguards Approach Handling Plutonium for the JNC-1

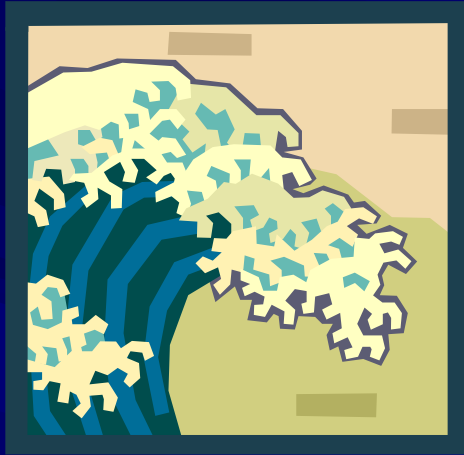
- Random interim inspection
- Remote monitoring system
- Providing facility information more frequently



- Human resources for inspection will be decreased by 1/3
- Will not disturb facility operations

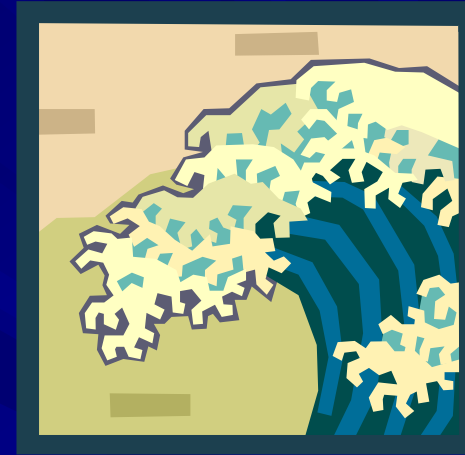


# Two Major Nuclear Trends



## Increased Concern about Nuclear Proliferation

- ✓ Nuclear black market
- ✓ Iran, DPRK, Syria
- ✓ Nuclear terrorism



## Expansion of Peaceful Use of Nuclear Energy

- ✓ Worldwide recognition of nuclear energy's role

➤ To help sever the link between the two trends

# Cut Ties between Two Emerging Trends

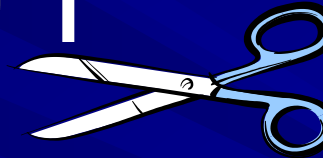


time

*should be increased*

***Peaceful Use of Nuclear Energy***

➤ **Nuclear Renaissance**



***Concern about Nuclear Proliferation***

➤ **Nuclear black market**

➤ **Iran and DPRK**

➤ **Nuclear Terrorism**

*should be decreased*

# A World without Nuclear Weapons and Peaceful Use of Nuclear Energy

Importance of dual pursuit of two objectives

**Toward A world  
without  
Nuclear Weapons**

**Nuclear Disarmament**

**Nuclear Non-Proliferation**

**Peaceful Use of Nuclear Energy**

# Towards a World without Nuclear Weapons

*Regime beyond NPT (at present)*

*NPT is not panacea, and needs to be supplemented by additional measures.*

**Nuclear  
Non-Proliferation**

**Nuclear Disarmament**



PSI

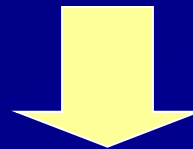
UNSC1540

NSG



CTBT

FMCT



***Further New Regime (in the future)***

*ex. Multilateral Nuclear Approach, Assurance of Fuel Supply.....*

# Responsibilities of Nuclear Energy States

## *Ensuring the “3S”*

- **Safety**: *Nuclear Safety*
  - ✓ Regulatory framework, measures to strengthen earthquake-resistance
- **Safeguards**: *Nuclear Non-Proliferation, Safeguards*
  - ✓ Comprehensive Safeguards Agreement, Additional Protocol
- **Security**: *Physical Protection, Nuclear Security*
  - ✓ Countermeasures against nuclear terrorism



### G8 Hokkaido Toyako Summit Leaders Declaration (July 2008)

- *Fundamental principles for the peaceful use of nuclear energy*
- *An international initiative proposed by Japan on 3S-based nuclear energy infrastructure will be launched*
- *The role of IAEA in this process*

# International Various Initiatives

- IAEA 20/20
- Next Generation Safeguards Initiative (U.S.)
- Load to 2010 (U.K.)
- Asia Pacific Safeguards Network (Australia)
- UNSCR 1887

# JAEA International Forum 2008

*Nuclear Nonproliferation and Peaceful Use of Nuclear Energy  
In the Asia Region*

**June 24-25, 2008, Tokyo**



*Next JAEA International Forum  
will be held in December 3-4, 2009 in Tokyo.*



**Thank you for your kind attention**