Country Report of Japan

The 24th FNCA Ministerial Level Meeting
November 28, 2023

Dr. TOKUMASU Shinji, Deputy Director General
for Science, Technology and Innovation Policy

Cabinet Office, Japan

Contents

Basic Policy for Nuclear Energy

1. Background and Objective

- **A compass to show long-term directions for government policy** on nuclear energy
- Revised in February 2023 in light of **changes in the environment surrounding nuclear energy**

2. Important Initiatives

① Reflections and Lessons from the Fukushima Daiichi Nuclear Power Station Accident

② Use of nuclear energy for stable energy supply and carbon neutrality

- Restarting existing nuclear power plants
- Efficient safety examinations
- Long-term operation of nuclear power plants
- Development and construction of innovative nuclear reactors
- Expansion of spent fuel storage capacity etc.

③ Nuclear energy in the global context

④ Peaceful use of nuclear energy: securing non-proliferation and nuclear security

⑤ Rebuilding public trust and confidence in the use of nuclear energy

⑥ Decommissioning of nuclear stations and the radioactive waste management under the involvement of the government

⑦ Promoting the utilization of radiation and radioisotopes

⑧ Initiatives to create nuclear innovation

⑨ Strengthening nuclear human resource development

White Paper on Nuclear Energy

Special Report

Current Status of Research, Development and Innovation on the Nuclear Energy

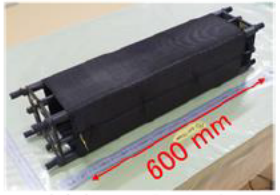
Topic 1 : Development of innovative reactors that actualize both safety improvements and decarbonization promotion

Silicon carbide composite-coated tubes, etc.

End plug sealing structure

Topic2 : Development of Accident Tolerant Fuel that suppresses hydrogen generation

Topic3 : Development of aging degradation evaluation method for highly aged nuclear power reactors

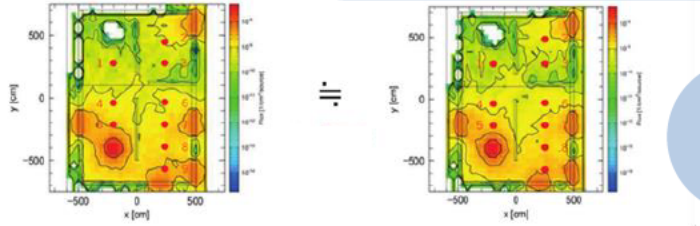


SiC Channel Box Preform

Topic4 : Technology development for decommissioning under high radiation dose

Topic5 : Challenges in reducing hazardousness of spent fuel by separation and transmutation

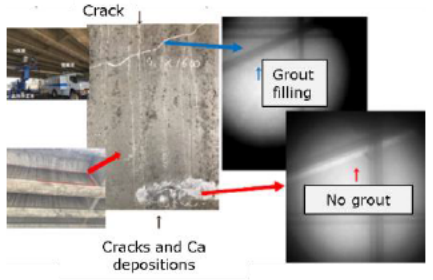
Topic6 : Development of non-destructive inspection techniques using radiation to support economic and social activities



Distribution with Monte Carlo calculation

Distribution with inverse estimation method

Topic7 : Research on social science aspects of nuclear energy utilization



Basic Policy for GX (Green Transformation)

- To rebuild a stable supply of energy, measures including promoting drastic shift to decarbonized power sources will be taken.

Renewable Energy

A grid development plan has been established.

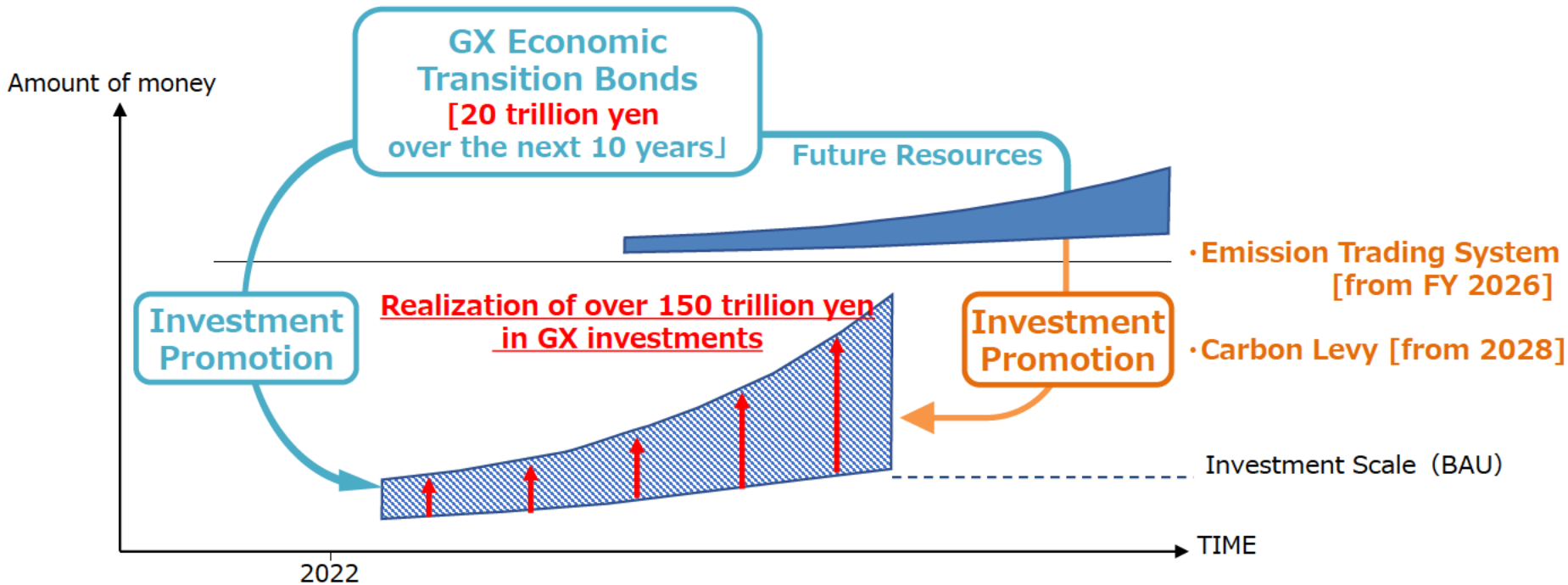
Investment in the next 10 years will be 8 times compared to the past 10 years.

Nuclear Power

Replacement of reactors decided to be decommissioned with next generation innovative reactors.

Review of operating period

(40 years + 20-year extension + shutdown period such as inspection)



Energy Policy Objectives and Future Power Generation

Energy Policy

S+3E Principle

S: Safety

E: Energy Security

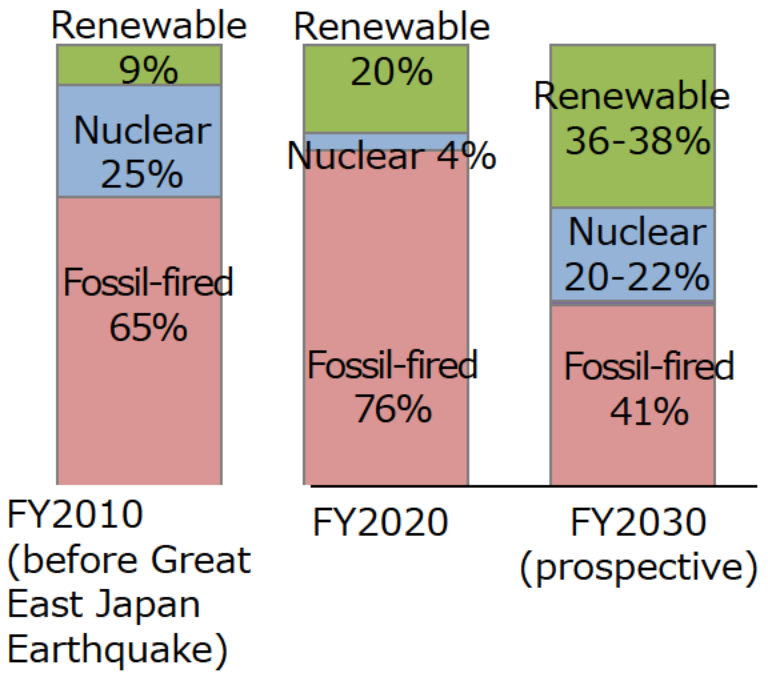
E: Economic efficiency

E: Environment

One option that could be taken to achieve the energy policy is nuclear power.

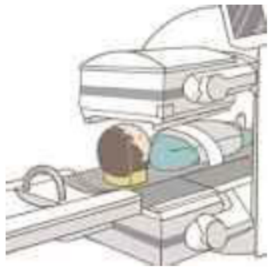
Power Generation Mix

Nuclear power is expected to compose approx. 20-22% of the total generation mix in FY2030.



The 6th Strategic Energy Plan (Oct. 2021)

Promotion and Utilization of Medical Radioisotopes (Basic Direction)



<Goals to be achieved in the next decade>

(1) Establish a stable nuclear medicine-related diagnosis system through partial domestic production of ^{99}Mo/ ^{99m}Tc

(2) Provide patients with nuclear medicine treatment using domestically produced radioisotopes

(3) Disseminate nuclear medicine treatment in medical institutions

(4) Turn radioisotope-related fields, centered on nuclear medicine, into a "strength" of Japan

<Four actions to achieve the goals>

(a) Promote initiatives for domestic production and stable supply of important radioisotopes

(b) Establish a system to promote the use of radioisotopes in medical institutes

(c) Promote R&D that contributes to the domestic production of radioisotopes

(d) Strengthen research infrastructure, human resources, and networks for the production and utilization of radioisotope

from "The Action Plan for Promotion of Production and Utilization of Medical Radioisotopes", Japan Atomic Energy Commission, May 31,2022

Human Resource Development and Exchange (Nuclear)
Example of Activity - MEXT

Concerns about sustainability of nuclear education

- Lack of young faculty members to replace retiring faculty members
- Aging of research facilities, which are being closed and not replaced

Collective measures to maintain and strength nuclear education foundation

MEXT: Ministry of Education, Culture, Sports, Science and Technology - Japan

ANEC: Advanced Nuclear Education Consortium for the Future Society

Consortium of Japanese nuclear education and training established in October 2021

This cooperation system aims :

(1) Constructing comprehensive educational programs and sharing lectures utilizing information technology
(2) Providing opportunities for practical training utilizing research reactors or other nuclear research facilities
(3) Providing opportunities for international study through systematic collaboration with international organizations and overseas universities
(4) Promotion of collaboration with industry and other fields

ANEC ADVANCED NUCLEAR EDUCATION CONSORTIUM FOR THE FUTURE SOCIETY

In addition, an outreach activities to high school students was held in 2023 to attract the young generation.
30 students joined this event.
In the 1st part, the students did experiment on The University Teaching and Research Reactor of Kindai University (UTR-KINKI).
In the 2nd part, invited 21 organizations (universities, companies, and research institute) introduced students to the rewarding nuclear technology works.
It was an opportunity for students to consider their own career paths.

Outreach activities at Kindai University (Aug.24th)

Thank you for your attention.