

Summary of “White Paper on Nuclear Energy 2018”

September 2019
Japan Atomic Energy Commission



The Structure of the FY2018 White Paper on Nuclear Energy

Following the outline of the Basic Policy for Nuclear Energy (approved by the Cabinet in July 2017), the white paper consists of the Special Report and separate chapters (chapters 1-8). This document was prepared with the cooperation of related ministries.

【Special Report】: Decommissioning and managing nuclear facilities

The decommissioning of R&D facilities and the handling of radioactive waste are becoming increasingly important in the field of nuclear energy. This report discusses the latest overseas developments and analyzes management methods that would help improve procedures, enhance technologies, and strengthen public trust.

【Main Contents】

Chapter 1

The steady reconstruction and revival of Fukushima, and the tireless safety improvements based on the important lessons learned from the incident

Chapter 2

Using nuclear energy to address global warming issues, and people's livelihoods and the economy

Chapter 3

Efforts at home and overseas **in a global context**

Chapter 4

Peaceful use, non-proliferation, and ensuring **nuclear security**

Chapter 5

Rebuilding public trust as a precondition for using nuclear energy

Chapter 6

Decommissioning and the treatment of **radioactive waste**

*Unlike the Special Report, this mainly discusses the decommissioning of facilities after the TEPCO Fukushima Daiichi accident, and the current status of geological disposal of highly radioactive waste

Chapter 7

Promoting the utilizing of **radiation and radioisotopes**

Chapter 8

Strengthening the foundations for using nuclear energy

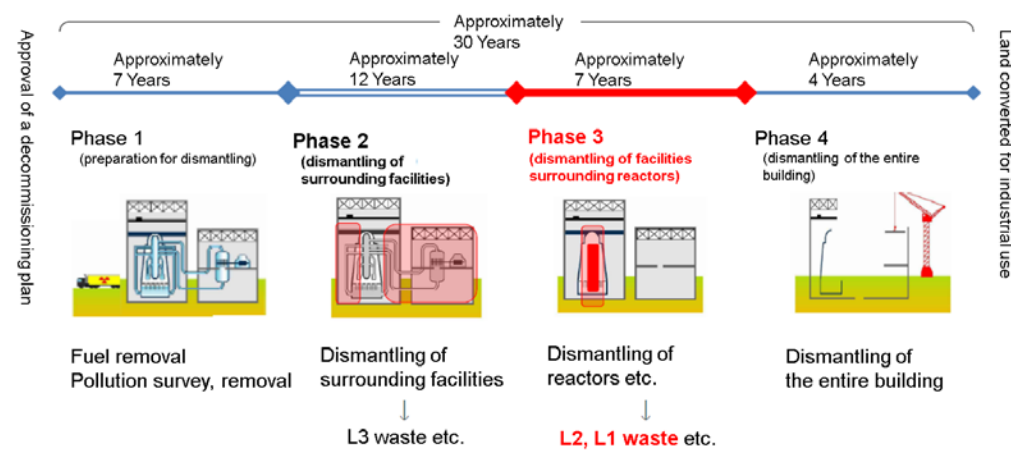
Special Report Decommissioning and Managing Nuclear Facilities

- **In Japan**, many research reactors, of which purposes have been completed, and the aged nuclear reactors for power generation are **increasingly being decommissioned**.
- In the West many nuclear facilities, including those for commercial use, have been commissioned.
- **It is important to study previous cases**, create and implement effective decommissioning measures, and improve relations with local residents.

▶ In Japan, 24 commercial nuclear power plants either have been, or are being, decommissioned. The Japan Atomic Energy Agency (JAEA) has announced a plan to decommission about half of its R&D facilities (43 facilities).

Nuclear decommissioning, a common issue worldwide, is **a long-term process that spans several generations**. Creative efforts are required for the smooth and effective implementation of the necessary technologies.

The following insights from the experiences of the West (the U.S., Germany, France, and the U.K.) could be useful as Japan decommissions more facilities.



The process of decommissioning in general

Measures Considered

- Streamlining overall operations (**management**)
- **Dialogues** with stakeholders, such as the **regulators**
- **Radioactive waste management and technological development**
- **Gaining the trust** of local residents

Important Initiatives for Nuclear Energy in Japan and its Direction 【Chapters 1-4】

Chapter 1: The steady reconstruction and revival of Fukushima, and tireless safety improvements based on important lessons learned

- This chapter discusses initiatives for reconstructing and reviving Fukushima (**measures to deal with radiation, the decontamination of waste, the status of the “specified reconstruction and revival base” plan, and the Fukushima Innovation Coast Framework**).
- It discusses nuclear power companies' continuous safety improvements, such as **enhanced voluntary initiatives**, efforts to prevent tragic accidents, and future directions.
- It discusses the framework for nuclear disaster countermeasures, regional efforts to strengthen nuclear disaster prevention plans, comprehensive nuclear disaster prevention drills, and environmental radiation monitoring, based on the important lessons learned from the accident.

Chapter 2: Using nuclear energy to address global warming issues, and people's livelihoods and the economy

- This chapter argues that Japan should promote nuclear power to supply stable energy and respond to global warming, based on the premise that safety is assured. **It discusses reports released by international organizations regarding the effectiveness of nuclear power, as well as initiatives undertaken by each country.**

Chapter 3 Efforts at home and overseas in a global context

- This chapter describes trends in major nations using nuclear energy and in the industry as a whole.
- Japan participates in, and cooperates with, international organizations (IAEA, OECD/NEA, etc.), and cooperates and collaborates with other nations through bilateral nuclear energy agreements and partnerships.
- Multilateral cooperation is also carried out, such as through the International Framework for Nuclear Energy Cooperation (IFNEC) and the Forum for Nuclear Cooperation in Asia (FNCA).

Chapter 4: Peaceful use, non-proliferation, and ensuring nuclear security

- JAEC **released the “Basic Policy on the Utilization of Plutonium in Japan” on July 31, 2018.**
- Under the principle that Japan **will not possess any plutonium that it does not need**, JAEC:
 - (1) puts forth a plan to reduce Japan's plutonium stockpile
 - (2) states that the reprocessing amount must be approved by the government, and that the storage capacity for spent fuel should be expanded.
- JAEC, based on the international plutonium management guidelines, reports on the status of plutonium management in Japan.
- Japan had 45.7 tons of separated plutonium as of the end of 2018, down about 1.6 tons.

Important Initiatives for Nuclear Energy in Japan and its Direction [Chapters 5-8]

Chapter 5: Rebuilding public trust as a precondition for using nuclear energy

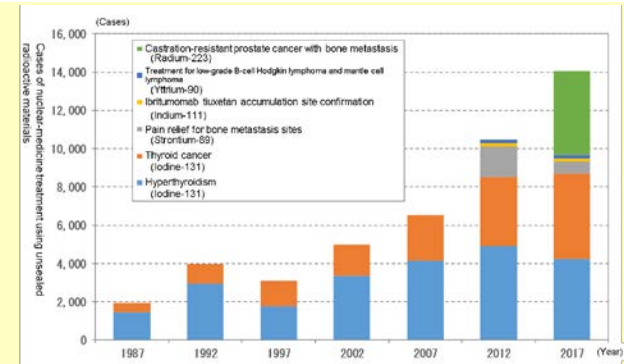
- It is essential to create an environment where people can deepen their understanding and form opinions based on scientifically accurate information and objective facts (evidence). This chapter discusses the **progress and cooperation among relevant organizations**.

Chapter 6: Decommissioning and the treatment of radioactive waste

- This chapter discusses the status of decommissioning at TEPCO's Fukushima Daiichi nuclear plant and efforts related to geological disposal of high-level radioactive waste.
- The release by NUMO of **a comprehensive technical report on the treatment of high-level radioactive waste** and its attempts to strengthen its outreach

Chapter 7: Promoting the utilizing of radiation and radioisotopes

- Radiation and radioisotopes, which share a common foundation with nuclear power, are used in a wide range of fields related to people's lives in a variety of ways.
- The economic applications of radiation have been increasing over the past 10 years, especially in healthcare and medical science.
- This chapter discusses practical applications of α -rays and neutrons in the medical and industrial fields in Japan.



Changes in nuclear-medicine treatment cases

Chapter 8: Strengthening the foundations for using nuclear energy

- This chapter argues three points for strengthening basic R&D: (1) the knowledge base should be enhanced systematically, (2) capable human resources must be secured and nurtured to support such an effort, and (3) it is important that R&D organizations should promote functional reforms, while pursuing basic research and human resource development, in accordance with their respective roles.
- Regarding the strengthening of basic infrastructure and the promotion of innovation, this chapter introduces JAEC's **stance on technology development and R&D**. It explains how technological development and R&D should be pursued following the deregulation of the nation's electricity market. It also discusses JAEC's views regarding cooperation with research organizations and nuclear power operators.
- Regarding the securing and nurturing of human resources, this chapter states that one of the challenges is to improve the capabilities of employees who have already graduated from universities, in addition to strengthening or improving university education in general.