

White Paper on Nuclear Energy 2016

– Summary –

1. Background

- The White Paper on Nuclear Energy has been published on a continuous basis since the launch of the Japan Atomic Energy Commission (JAEC) in 1956 through 2010, the year before the TEPCO Fukushima nuclear power plant accident (the Fukushima accident).
- Subsequent to the 2009 edition (published in March 2010), the White Paper was suspended, as attention was focused on responses to the Fukushima accident and subsequent review and reform of the JAEC.
- The report of the Experts Committee for Review of the JAEC suggested that there was value in publishing the White Paper, and the Amended Act for Establishment of JAEC clearly called for the task of "the collection of information and conducting of surveys concerning nuclear utilization."

2. Objectives

- The White Paper on Nuclear Energy is intended to fulfill the responsibility of the Japanese Government to the Japanese people to comprehensively and continuously provide explanation on the Government's initiatives in nuclear energy based on the lessons learned from the Fukushima accident and the changes in attitudes surrounding nuclear energy. Additionally, with attention focused from overseas on the state of nuclear energy in Japan, the White Paper is a suitable means of sharing information with the international community.
- At this time, JAEC has adopted the "Basic Policy for Nuclear Energy". The Cabinet has decided that the Government will respect this document for research, development and utilization of nuclear science and technology. It is important to present readily understandable information to the Japanese people, including the statement of "Basic Policy for Nuclear Energy".

3. Main Points of the White Paper

(1) "Basic Policy for Nuclear Energy"

JAEC adopted "Basic Policy for Nuclear Energy" and the Cabinet decided that the

Government will respect this document in July 2017. The White Paper provides explanation of the policy using data on the circumstances surrounding nuclear energy and international expertise.

(2) The experience and lessons-learned from the Fukushima accident and the efforts implemented based on them

Some organizations such as NAIIC (The Nuclear Accident Independent Investigation Commission) established by the National Diet of Japan after the Fukushima Nuclear Accident and the Governmental Investigation Committee conducted investigations concerning the Fukushima accident. The White Paper describes the reform of nuclear safety organization and systems as well as the ongoing efforts implemented based on the proposal of those organizations. The White Paper also describes tireless efforts to improve safety that have been made by nuclear industry, including nuclear operators. It describes the progress of recovery and reconstruction at Fukushima, and the effort made to tackle decommissioning of damaged reactors and develop counter measures to contaminated water.

(3) Fixed point observations of current status and measures implemented in the research, development, and utilization of nuclear energy in Japan

The White Paper comprehensively reports on the current activities and continuous efforts in entire areas of nuclear energy in Japan, which includes: ensuring peaceful uses; implementation of nuclear safety measures; rebuilding public trust; processing and disposal of radioactive wastes; developing and securing human resources; research and development; utilization of radiation; nuclear security; and international approaches.

【Introduction】 Basic Policy for Nuclear Energy

- "Basic Policy for Nuclear Energy" was adopted on July 20, 2017 by JAEC, and is the first full-scale policy recommendation of the Commission after its renewal. The Cabinet decided that the Government will respect this document for research, development and utilization of nuclear science and technology on the next day, July 21.
- The White Paper presents the entire text of the document along with its accompanying diagrams.

1. Changing environment surrounding nuclear energy

- A need exists to sincerely address the public distrust and anxiety about nuclear energy and rebuild social confidence
- A new competitive electric power market has emerged with full liberalization of the retail electricity market
- Further substantial reduction of greenhouse gas emissions over a long term will be difficult to achieve simply by applying existing countermeasures
- Increased use of existing thermal power stations and introduction of a feed-in tariff (FIT) system for renewable energy have led to higher electricity tariffs, which have had a major negative impacts on people's livelihood and economic activities

2. Fundamental issues ingrained in nuclear energy-related organizations

- The unique mindset and groupthink in Japan, the pressure to conform tacitly or forcibly to the opinion of the majority, and the tendency to maintain the status quo are all very strong, and they can be a problem.
- Another tendency within organizations is to lapse into sub-optimization. Creating a culture in which people can exchange a variety of opinions based on solid grounds, regardless of their standing inside or outside the organization, is necessary

3. Basic objectives and important initiatives of nuclear energy use

- Appropriate use of nuclear energy with thorough risk-management by responsible organizations is necessary.
- It is important to proceed with the use of nuclear energy with peaceful use and safety assurance as basic preconditions, winning the confidence of the people and bearing in mind both benefits and costs that nuclear technology can bring to the environment, people's livelihood, and economic activities.

(1) Seriously reflect on the Fukushima accident and learn lessons therefrom

- Establish a safety culture that overcomes weakness of traditional Japanese organizations and national cultures.
- Shift in safety assurance of a "culture of prevention" by promotion of risk management.

- (2) Pursue nuclear energy use addressing global warming issues and people's livelihood and the economy
 - The National Government needs to clarify the role that nuclear power generation can play over a long term and examine necessary measures therefor.
- (3) Nuclear energy in the global context
 - Collect and share international knowledge and experiences; improve international awareness
- (4) Peaceful use of nuclear energy: enhancing non-proliferation and security regimes
 - Take steps to assure the international community of Japan's peaceful use of plutonium t; Ensure the plutonium balance and responsible plutonium management; consume plutonium by pluthermal
- (5) Rebuilding public trust, as a major precondition
 - Create an information base for people to be able to deepen their understanding of the circumstances surrounding nuclear energy use in Japan based on scientifically accurate information and objective facts(evidence)
- (6) Steadily pursuing decommissioning and radioactive waste disposal
 - The resolute implementation of disposal of radioactive waste by the current responsible generation
- (7) Expanded use of radiation and radioisotopes
 - Develop necessary infrastructure to enable further use of radiation and radioisotopes including the use of quantum beams.
- (8) Solid foundation for nuclear energy use
 - R&D institutions and nuclear industry should collaborate and develop a deep and broad knowledge base.

⇒In light of the fact that the environment surrounding nuclear energy will keep changing substantially in the coming years, "Basic Policy for Nuclear Energy" is to be reviewed and revised, as necessary, roughly every five years.

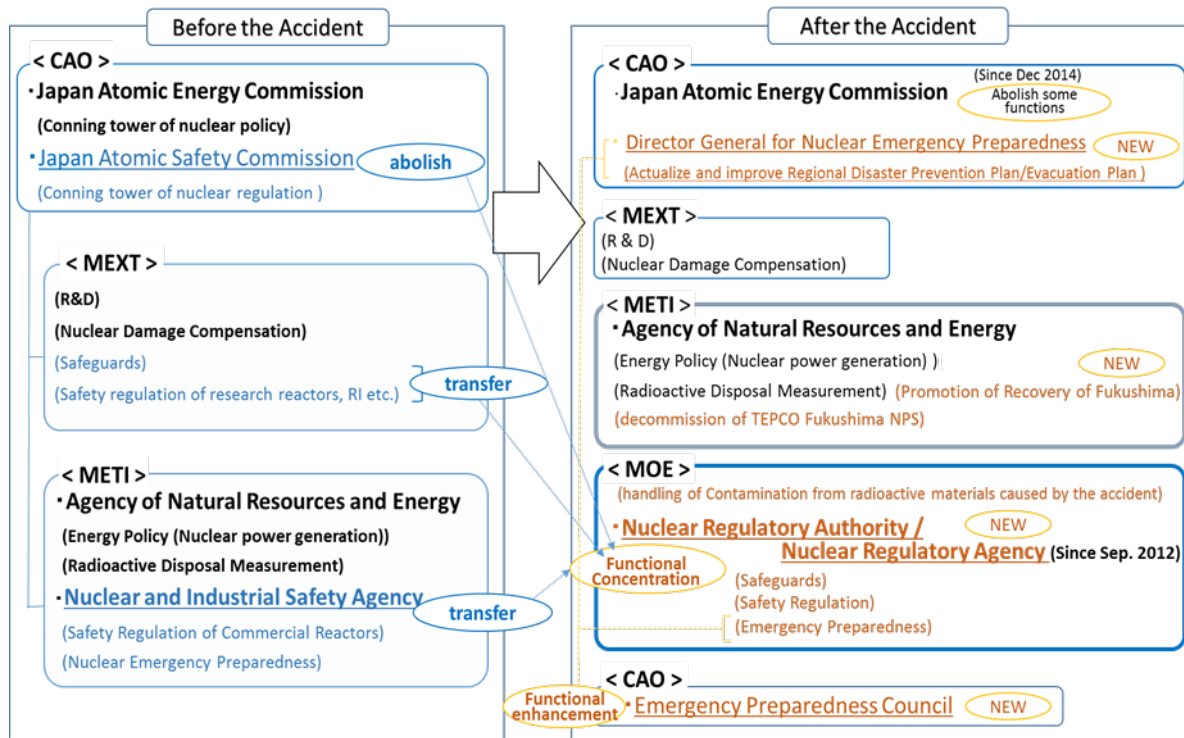
【Chapter 1】 Responding to the Fukushima accident and initiatives toward reconstruction and revival

1-1 investigations and verification of the Fukushima accident

- In the wake of the Fukushima accident, institutions in Japan and abroad, including the National Diet of Japan Fukushima Nuclear Accident Independent Investigation Commission (NAIIC), the Investigation Committee on the Accident at the Fukushima Nuclear Power Stations of Tokyo Electric Power Company (ICANPS), and the International Atomic Energy Agency (IAEA) conducted investigations and verification activities, and published numerous recommendations.
- While certain causes behind the accident remain unascertained due to extremely high levels of radioactivity and the resultant inability to conduct on-site studies, impact of the accident on society continues. Therefore, ongoing initiatives are needed to clarify causes of the accident and the extent of the damage.

1-2 Initiatives and structural reform in nuclear safety after the Fukushima accident

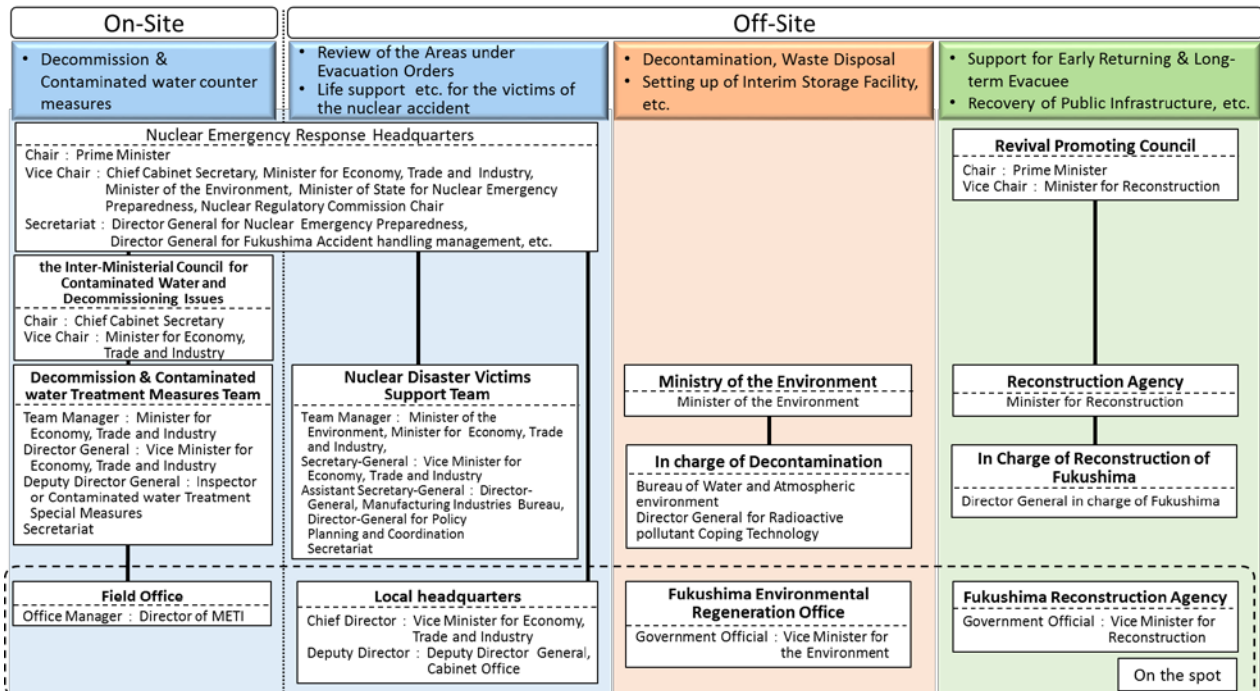
- The Government has strengthened nuclear safety regulations and measures for nuclear emergency response based on the recommendations of the NAIIC and ICANPS.
- The Nuclear Regulation Authority (NRA) has unified nuclear safety management and placed the safety of the people in the use of nuclear energy as its the highest priority. In particular, the NRA has newly developed the world's most stringent level of regulatory regime incorporating strengthened measures to deal with severe accidents and has conducted conformity reviews.
- The amended Act on Special Measures concerning Nuclear Emergency Preparedness has specified that the Government bear the responsibility of developing thorough measures to prevent nuclear disasters, assuming the possibility that such disasters could be caused by large-scale natural disasters. Amendments to the Atomic Energy Basic Act have strengthened the system by implementing such measures as the establishment of Nuclear Emergency Preparedness Council which coordinates overall nuclear disaster prevention.
- With the goal of achieving higher levels of safety, nuclear operators who have primary responsibility for ensuring safety have made efforts to improve and implement voluntary and ongoing safety improvement measures such as setting up voluntary regulatory organizations, utilization of risk assessment, and enhancement of their response to severe accidents. The Government is promoting voluntary improvements in nuclear power safety in the industry, including the development of roadmaps for light-water reactor safety technologies and for human resources development.



Post-accident review of nuclear safety governmental systems

1-3 Initiatives toward the reconstruction and revival of the Fukushima area

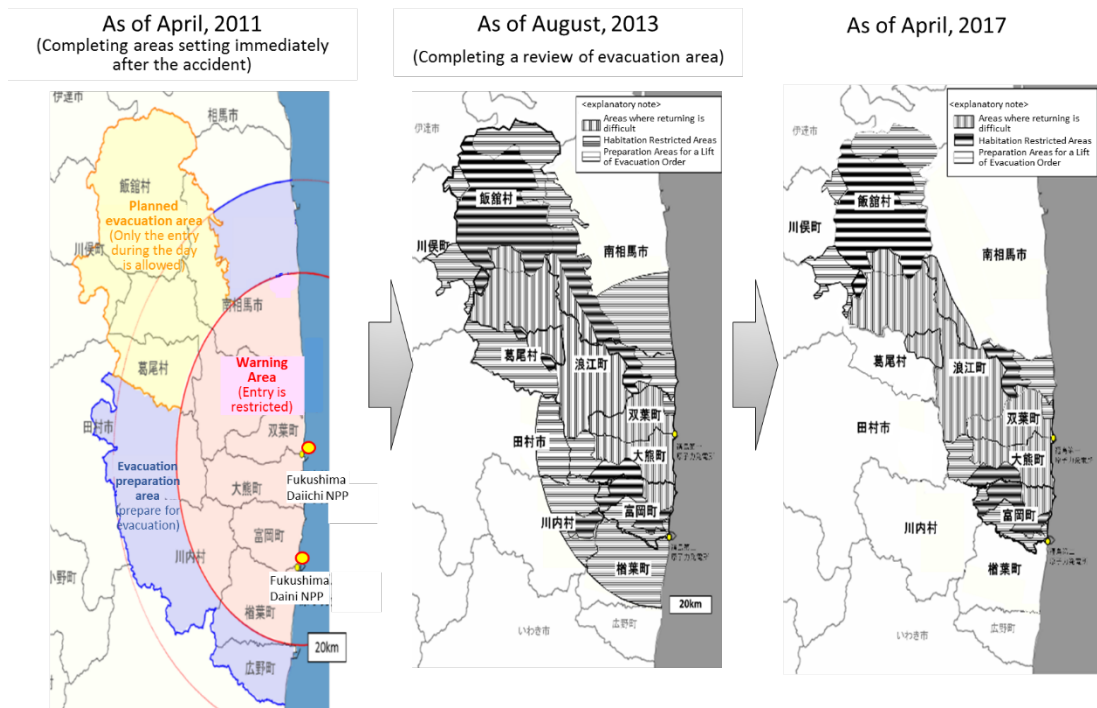
- Environmental contamination occurred due to the release of radioactive substances from reactor facilities in the TEPCO Fukushima Daiichi nuclear power plant.



The structure of government on the reconstruction and revival of the Fukushima area

(As of December, 2016), (source) Created by Office of Atomic Energy Policy based on "Initiatives toward the reconstruction revival of the Fukushima area" Reconstruction Agency

- The Government implemented emergency protective measures against radioactivity in the wake of the accident, including by issuing evacuation orders to residents and restrictions on the shipment of food products. To assess the effects of radiation on the human body and the environment, air dose rate monitoring and studies of the impact on health were conducted immediately after the accident.
- Yet even at the end of December 2016, the impact of the accident is ongoing, with many Fukushima residents remaining evacuated from their homes and some food shipment restrictions continuing. Therefore, the following measures are proceeding to lift the evacuation order and to restore and reconstruct the disaster area:
 - Decontamination, treatment of radioactive waste material, setting up of interim storage facility
 - Implementation of initiatives to support the reconstruction of lives through safety and security measures for early return of the evacuees, reconstruction of businesses and livelihoods, and measures to address rumors
 - Initiatives toward reconstruction and revival such as the Fukushima Innovation Coast scheme



Transition of evacuation area (from April 2011 to April 2017)

(source) Created by Office of Atomic Energy Policy based on “a review of evacuation area” (Team in Charge of Assisting the Lives of Victims of the Fukushima accident) and “image of evacuation area” (METI)

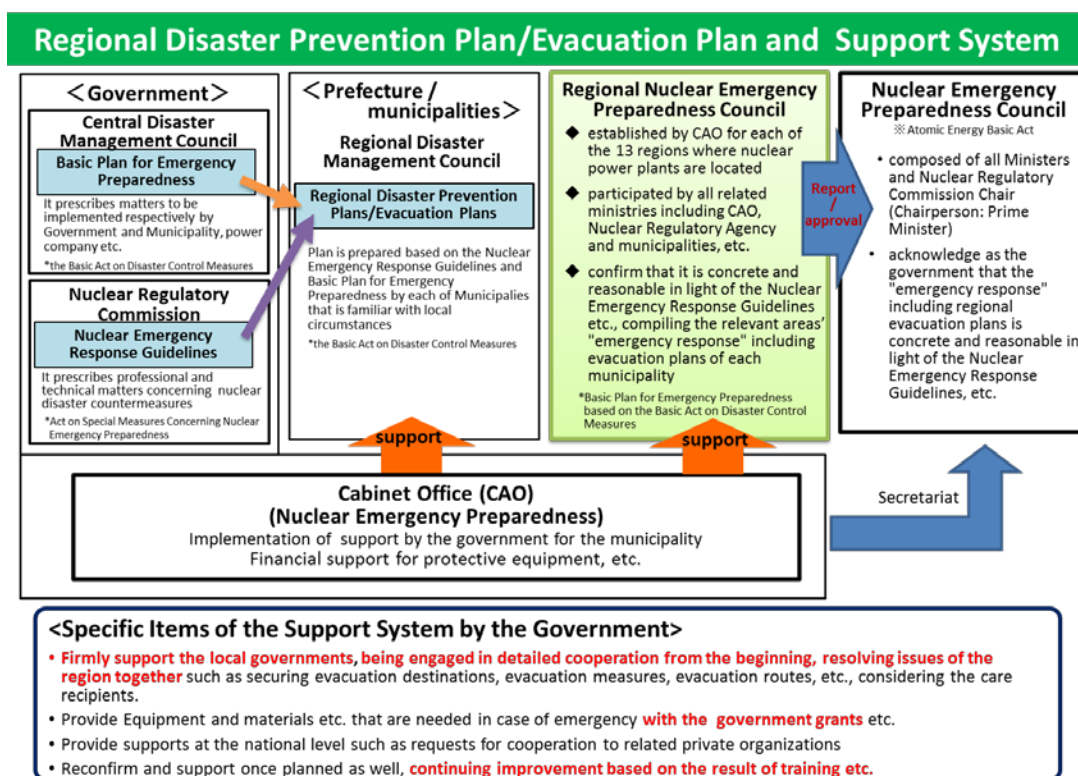
1-4 Efforts to decommission the TEPCO Fukushima Daiichi Nuclear Plant

- Decommissioning of the TEPCO Fukushima Daiichi Nuclear Power Plant and dealing with contaminated water is being implemented safely and steadily following the "Mid-to Long-Term Roadmap for Decommissioning the TEPCO Fukushima Daiichi Nuclear Power Plant." The roadmap sets basic guidelines and milestones for implementation of the decommissioning plan. Since the initial version was released in December 2011, the roadmap has been revised on an ongoing basis to reflect the progress of these initiatives.
- It will also incorporate a broad range of insight from within Japan and from overseas as well as further research and development to implement the decommissioning plan over the medium to long term. As it is important to promote efforts to develop and secure human resources such as researchers and engineers to maintain and continue the decommissioning work and to support research and development activities, the Government is going forward in setting up projects of research and development to deal with the highly complex technical issues associated with plant decommissioning as well as basic research, human resources development, and establishing proper research facilities.

【Chapter 2】 Basic activities pertaining to the use of nuclear energy

2-1 Nuclear safety measures

- Measures to improve nuclear safety based on lessons learned from the Fukushima accident have been implemented by IAEA, OECD/NEA, the United States, and other countries.
- In Japan, the nuclear safety regulation system was reorganized and nuclear safety regulations have been strengthened by implementing measures to deal with severe accidents, and by incorporating the latest knowledge.
- The Nuclear Regulatory Commission monitors and oversees initiatives to ensure safe operations by nuclear operators within the framework of new nuclear safety regulations and implements ongoing improvements in regulations based on the most up-to-date knowledge.
- The Nuclear Emergency Preparedness and Response Guidelines call for "continuous revision to improve effectiveness based on newly obtained knowledge and accurate assessments of the situation on the ground," and initiatives to enhance nuclear disaster preparedness is being implemented along with ongoing revision of the Guidelines.



Transition of evacuation area (from April 2011 to April 2017)

(source) Office for the Nuclear Emergency Preparedness's web site "Support for an improvement of a regional disaster prevention plan "

2-2 Nuclear Security

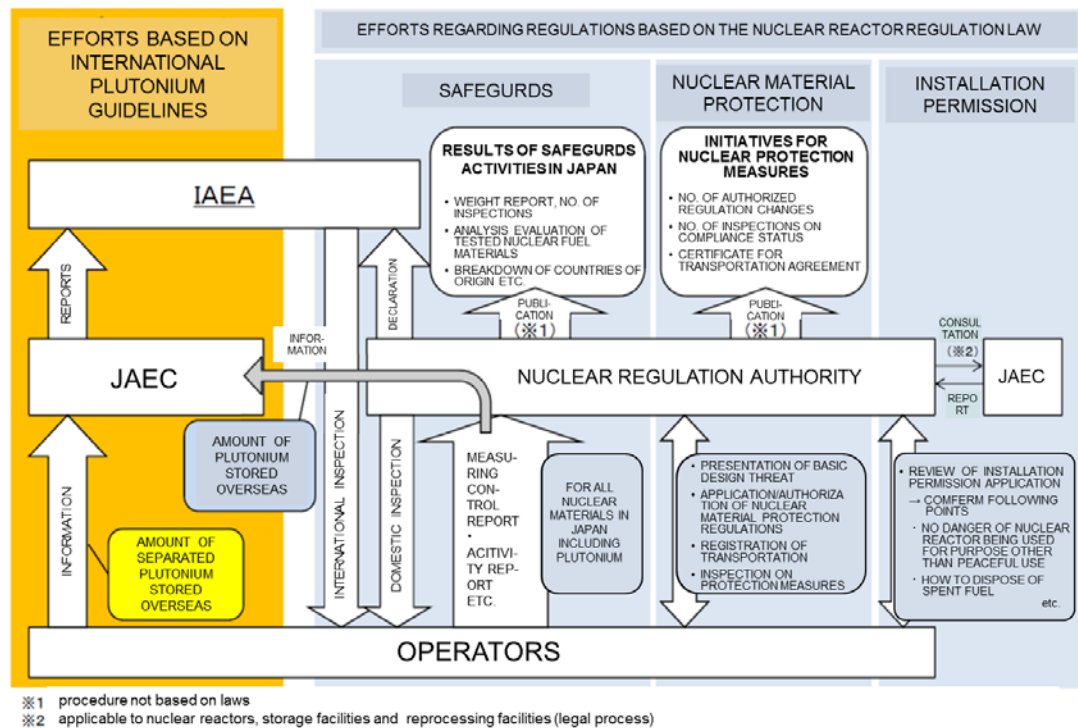
- The Government of Japan complies with the mandates of the "Convention on the Protection of Nuclear Materials and Nuclear Facilities", and requires, based on the Nuclear Reactor Regulation Law, that nuclear operators take appropriate steps to prevent interference or destruction of nuclear facilities and to prevent the theft of nuclear material at every stage, including its transport, storage, and use in nuclear facilities. The Government conducts periodic reviews of the implementation status of protective measures instituted by the operators.
- While there have been protective measures against the illegal movement of nuclear material and interference in or destruction of nuclear facilities or the transport of nuclear material, these protections are now being expanded to deal with the theft of radioactive substances and obstruction relating to facilities or transportation, as well as regulating nuclear materials and other radioactive substances that were outside of regulatory control.

2-3 Ensuring peaceful use

- The IAEA has established safeguards to promote the peaceful use of nuclear energy and has signed safeguard agreements with countries around the world to prevent the diversion of nuclear material from peaceful uses to military uses.
- Japan ensures the peaceful use of nuclear energy through strict application of IAEA safeguards and strengthened transparency in the use of plutonium.
- In August 2003, the JAEC adopted "the Basic Policy on the Utilization of Plutonium in Japan". Since then the JAEC has made its own efforts for toward ensuring transparency of regarding the use of plutonium such as requiring the electric utilities to submit plans for the use of plutonium.
- The Japanese Government has been strengthening the governance structure regarding reprocessing operations of spent nuclear fuel through the Spent Nuclear Fuel Reprocessing Fund Act, enacted by the Diet in May 2016. This act established the Nuclear Reprocessing Organization of Japan (NuRO) as an authorized corporation responsible for implementation of reprocessing. The Act stipulates that the Minister of Economy, Trade and Industry, in the process of approving the mid-term implementation plan for spent nuclear fuel reprocessing (MRP) of NuRO, shall ask for the view of the JAEC from the viewpoint of peaceful use of nuclear energy and securing the supply-demand balance of plutonium. Based on Japan's policy of "not possessing plutonium reserves of which use is unspecified" the JAEC will neutrally judge each plan's appropriateness in terms of supply-and-demand balance of plutonium and make public its view, and present its opinion to the Minister of Economy, Trade and Industry, electric utilities, and others as appropriate.
- In view of increasing worldwide concerns about Japan's plutonium stockpile, JAEC

believes that the steady consumption of plutonium in the form of MOX fuel for light water reactors is currently the only practical way of using plutonium.

(In September 2017, JAEC published explanation on the use of plutonium in Japan, "Plutonium Utilization in Japan": http://www.aec.go.jp/jicst/NC/about/kettei/kettei171003_e.pdf)

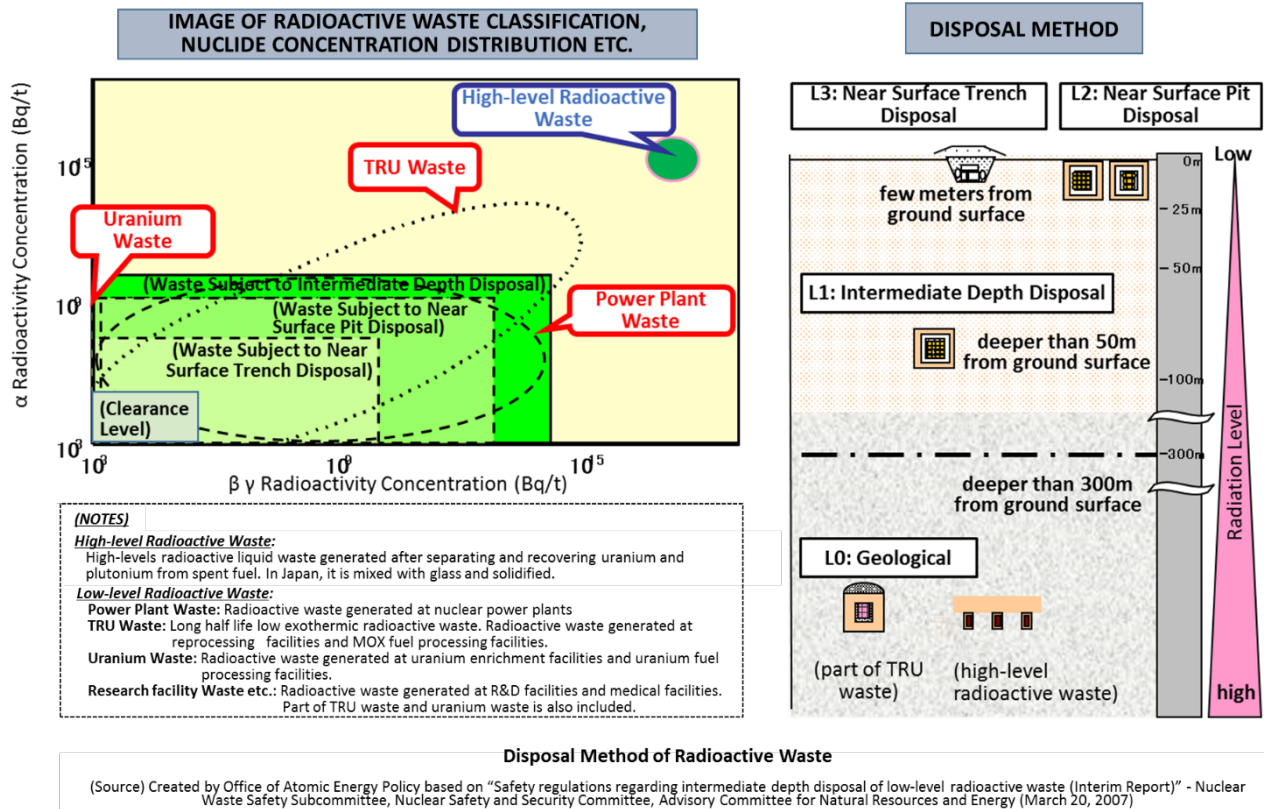


Structure to Ensure Peaceful Use of Nuclear Power

(Source) The 5th Council of Advisers for review of Japan Atomic Energy Commission's approach Material No. 5 the Secretariat of the Nuclear Regulation Authority, "Efforts of the Nuclear Regulation Authority regarding Peaceful Use etc. (Relationship with Japan Atomic Energy Commission etc.)" (2013)

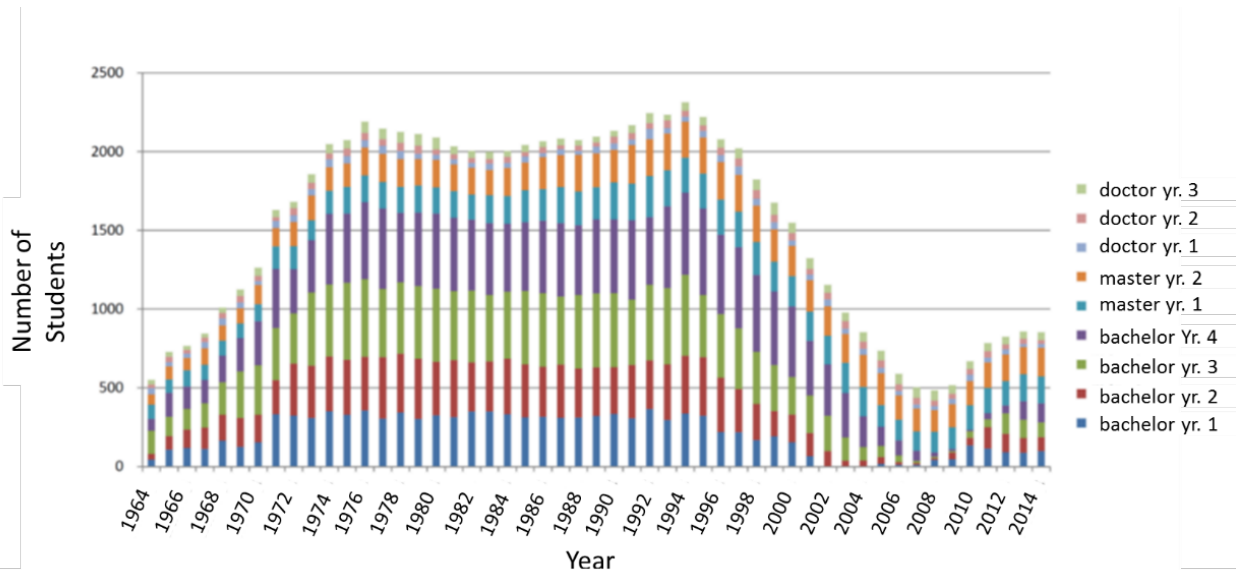
2-4 Treatment and disposal of radioactive waste

- Radioactive waste is generated by the use of nuclear energy and radiation and related research and development in nuclear power plants, nuclear fuel cycle facilities, universities, laboratories, and medical institutions, and by the demolition of those nuclear related facilities. The processing and disposal of these radioactive waste materials ensuring that these materials have no significant impact on human health or the living environment is a vital aspect of the use of nuclear energy.
- The White Paper explains an overview of the final disposal of high-level radioactive waste and initiatives in the treatment and disposal of low-level radioactive waste.



2-5 Securing and Training of nuclear energy human resources

- To improve safety from the lessons of the Fukushima accident, it is necessary to secure human resources with high levels of skill and safety consciousness. A variety of technologies will also be needed along with the people who can take charge of these technologies to handle the reprocessing of spent fuel, to treat, dispose of and eliminate radioactive waste, and to ensure the safe decommissioning of the TEPCO's Fukushima Daiichi Nuclear Power Plant.
- After reaching a peak in 1994, the number of students majoring in nuclear energy has declined, and has trended flat in recent years at around 750. Moreover, in the wake of the Fukushima accident, there has been an ongoing decrease in the number of engineering personnel participating in joint briefings by nuclear energy-related companies and new hires among electric power operators.



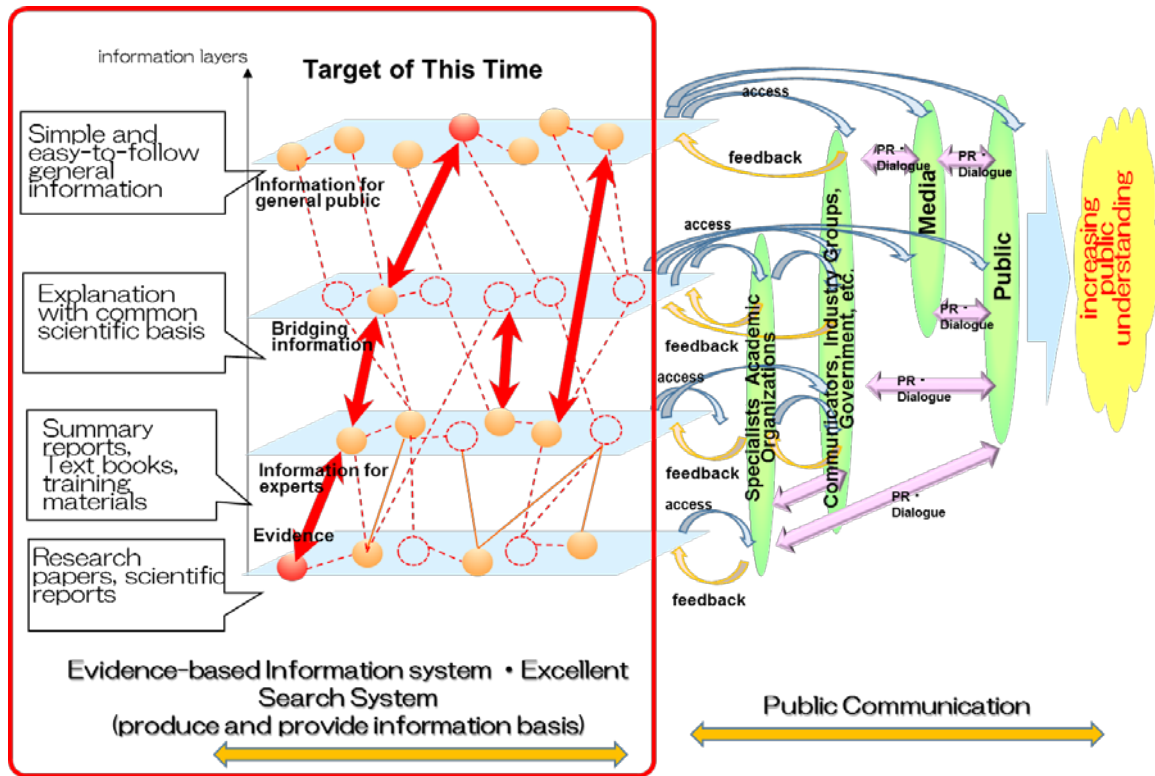
Note 1) Total of the middle classification "atomic energy physics related" and "nuclear engineering related" in the departmental classification table of the School Basic Statistics
 Nuclear engineering related (universities): nucleus engineering, nuclear engineering, nuclear reactor engineering, atomic engineering, applied nuclear engineering, system quantum engineering, quantum energy engineering, nuclear technology applied engineering, nuclear safety engineering
 Nuclear physics related (postgraduate schools): nucleus physics, nuclear cosmic ray studies, nuclear physics
 Nuclear engineering related (postgraduate schools): nucleus engineering, atomic engineering, applied nucleus engineering, quantum energy engineering, energy quantum engineering, nuclear energy safety engineering, collaborative nuclear power, nuclear system safety engineering, quantum radiation related
 Note 2) Created by MEXT based on "School Basic Statistics" - MEXT

Changes in the Number of Students in Nuclear related Departments

(Source) Nuclear Human Resources Development Working Group, Research Plan Evaluation Subcommittee, Council for Science and Technology
 (1st) material 4-2 "Student Trends in School Basic Statistics" – MEXT (2015)

2-6 Coexistence of the public and local communities with nuclear energy

- The accident investigation report identified problems in the way the Government and TEPCO provided information to citizens about the situation of the accident and the effects of radiation on the human body, as well as problems in the content of the information itself. The report also identified issues in the way information should be presented to the public in normal times, and not just in times of an emergency, such as an accident.
- These problems are some of the main factors underlying the general public's distrust and anxiety about nuclear energy. To rebuild public trust, the Government and nuclear operators have participated in town hall style meetings and fostered open dialogs and exchanges of information with communities where power plants are located as well as with the communities that consume the electric power those plants generate.
- JAEC has identified the need to build information systems based on scientific understanding (evidence) that enables anyone with nuclear energy-related questions to independently find explanations and answers to help them develop a deeper understanding.



Increasing Public Understanding – Establishment of Evidence-based Information System
 (Source) "Increasing Public Understanding – Establishment of Evidence-based Information System–(a view)" (2016)

- In the column, the Japan Atomic Energy Commission introduced some of the initiatives of the Nuclear Regulatory Commission (NRC) and the Nuclear Energy Institute (NEI) in the United States as examples of how to build evidence-based information systems.

The image shows a screenshot of the Nuclear Energy Institute (NEI) website. Several sections are highlighted with red boxes and arrows:

- Why Nuclear Energy**: Includes 'Clean Air Energy', 'Value of Electricity Diversity', 'Reliable & Affordable Energy', and 'Economic Growth & Job Creation'.
- Clean Air Energy**: Discusses 'Clean Air Benefits' and 'Climate Change'.
- Climate Change**: Contains a section titled 'An analysis'.
- FAQ About Nuclear Energy**: Includes 'The Basics' and 'Economic Benefits'.
- Resources**: Lists 'U.S. Environmental Protection Agency, EPA analysis of the American Power Act of 2010' and 'The Global Climate Change Adaptation and Resilience Report'.
- white paper**: Titled 'Nuclear Costs in Context'.

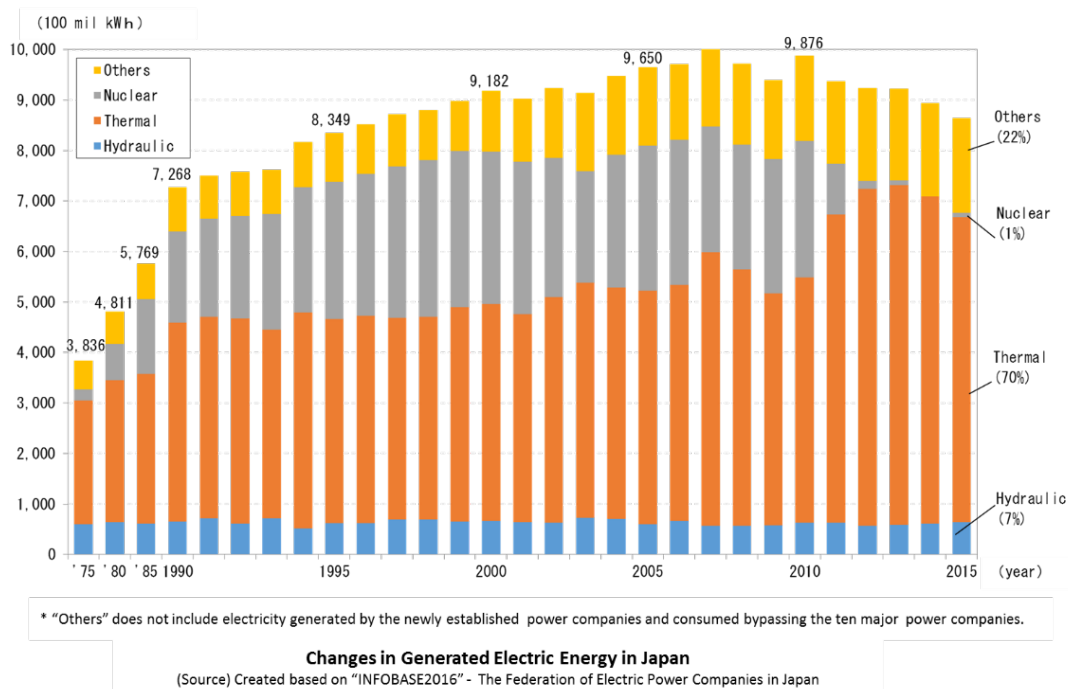
Case of Providing Information on NEI Website
 (Source) "Reference Material" No. 1-3, the 25th JAEC Commissioners' Meeting (2017)

【Chapter 3】 Utilization of nuclear energy and radiation

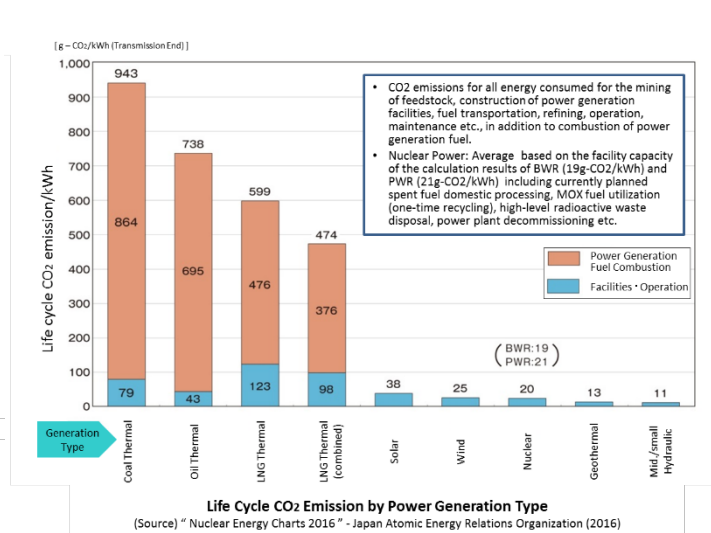
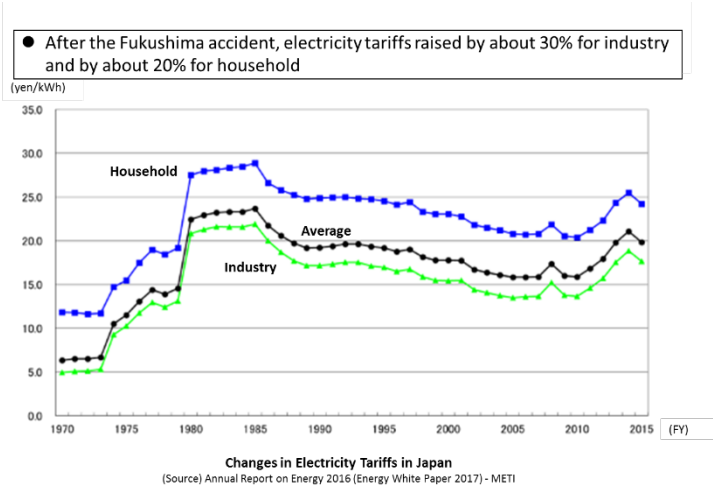
3-1 Utilization of nuclear energy

(1) Nuclear Power Generation

- The Fukushima accident had an enormous impact on the people of Fukushima Prefecture and many other Japanese citizens. The accident increased the level of people's distrust and anxiety about nuclear energy. It is essential to confront this distrust and anxiety honestly and directly, and rebuild social confidence by making greater efforts to alleviate people's concerns.
- The Government's basic policy is that dependency on nuclear power generation will be lowered to the extent possible by energy saving and introducing renewable energy as well as improving the efficiency of thermal power generation, etc.

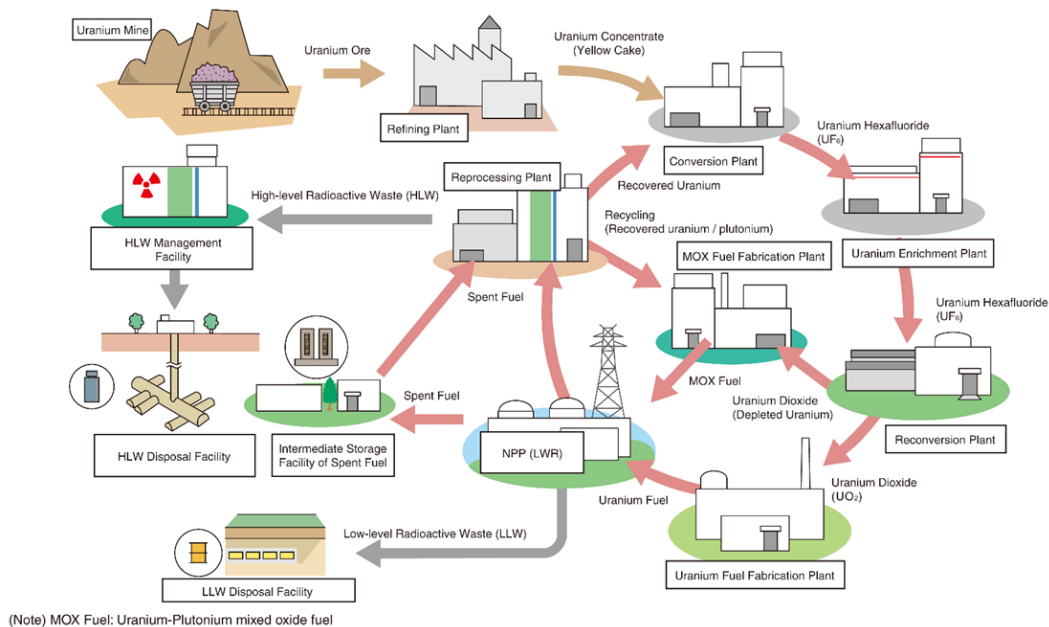


- Efforts need to be made to resolve the following issues that Japan faces
 - At 94.4%, Japan's dependence on overseas resources is one of the highest among industrialized nations.
 - Burden on the public has increased in the form of higher electricity rates due to greater reliance on thermal power generation using imported fossil fuels to replace nuclear power, as well as the introduction of the feed-in tariff system for renewable energy
 - Efforts must be made to reduce greenhouse gas emissions to deal with the problem of global warming



(2) Nuclear fuel cycle

- Establishment of a "nuclear fuel cycle" is a basic national policy where spent nuclear fuel generated by nuclear power plants is reprocessed and recovered plutonium and uranium are effectively used as fuel,.
- Keeping in mind that safety always comes first, the Government and nuclear operators have been making efforts to implement this basic policy with understanding and cooperation of the public including communities surrounding nuclear power plants.



Nuclear Fuel Cycle
 <ref>Japan Atomic Energy Relations Organization
 「Graphical Flip-chart of Nuclear & Energy Related Topics 2016

- Due to the possibility of the diversion of uranium-enrichment facility and reprocessing facility for production of high enriched uranium and plutonium which might be used for nuclear weapons, the use of these facilities and materials is strictly limited to peaceful purposes in accordance with the Atomic Energy Basic Law. Furthermore, transparency relating to peaceful use should be increased to allay concerns both within Japan and internationally.

	2009	2011	2013	2015	Change in 2001–2015 (1,000tU)	Change
Identified Total (1,000tU)						
<USD 260/kgU	6306.3	7096.6	7635.2	7641.6	1335.3	0.2
<USD 130/kgU	5404.0	5327.2	5902.9	5718.4	314.4	0.1
<USD 80/kgU	3741.9	3078.5	1956.7	2124.7	-1617.2	-0.4
<USD 40/kgU (注 2)	796.4	680.9	682.9	646.9	-149.5	-0.2
Reasonably Assured Resources (1,000tU)						
<USD 260/kgU	4004.5	4378.7	4587.2	4386.4	381.9	0.1
<USD 130/kgU	3524.9	3455.5	3698.9	3458.4	-66.5	0.0
<USD 80/kgU	2516.1	2014.8	1211.6	1223.6	-1292.5	-0.5
<USD 40/kgU (注 2)	569.9	493.9	507.4	478.5	-91.4	-0.2
Inferred Resources (1,000tU)						
<USD 260/kgU	2301.8	2717.9	3048.0	3255.1	953.3	0.4
<USD 130/kgU	1879.1	1871.7	2204.0	2260.1	381.0	0.2
<USD 80/kgU	1225.8	1063.7	745.1	901.1	-324.7	-0.3
<USD 40/kgU (注 2)	226.6	187.0	175.5	168.4	-58.2	-0.3

note1) Changes might not equal differences because of independent rounding.

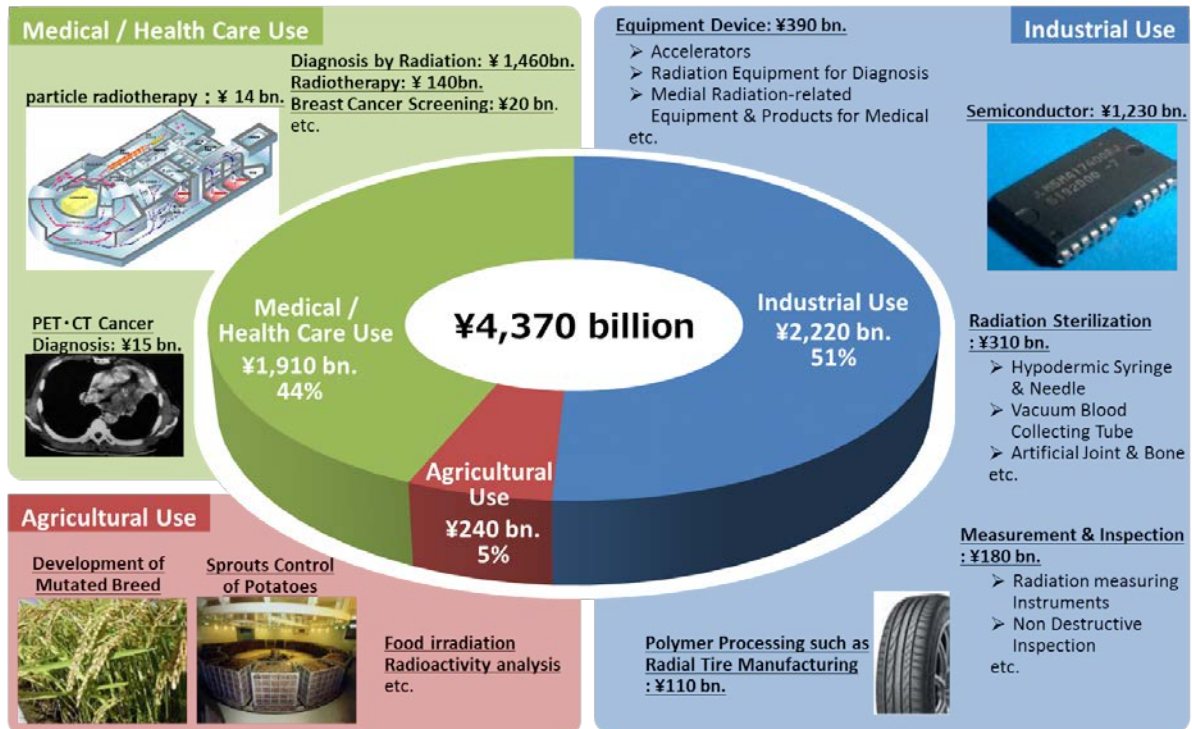
note2) higher than reported, because some countries have data that are not available, or the data are confidential.

Global Uranium Reserves

<ref>OECD/NEA & IAEA「Uranium 2016: Resources, Production and Demand」¹(2016) and「Uranium 2011: Resources, Production and Demand」¹(2012年)

3-2 Utilization of radiation

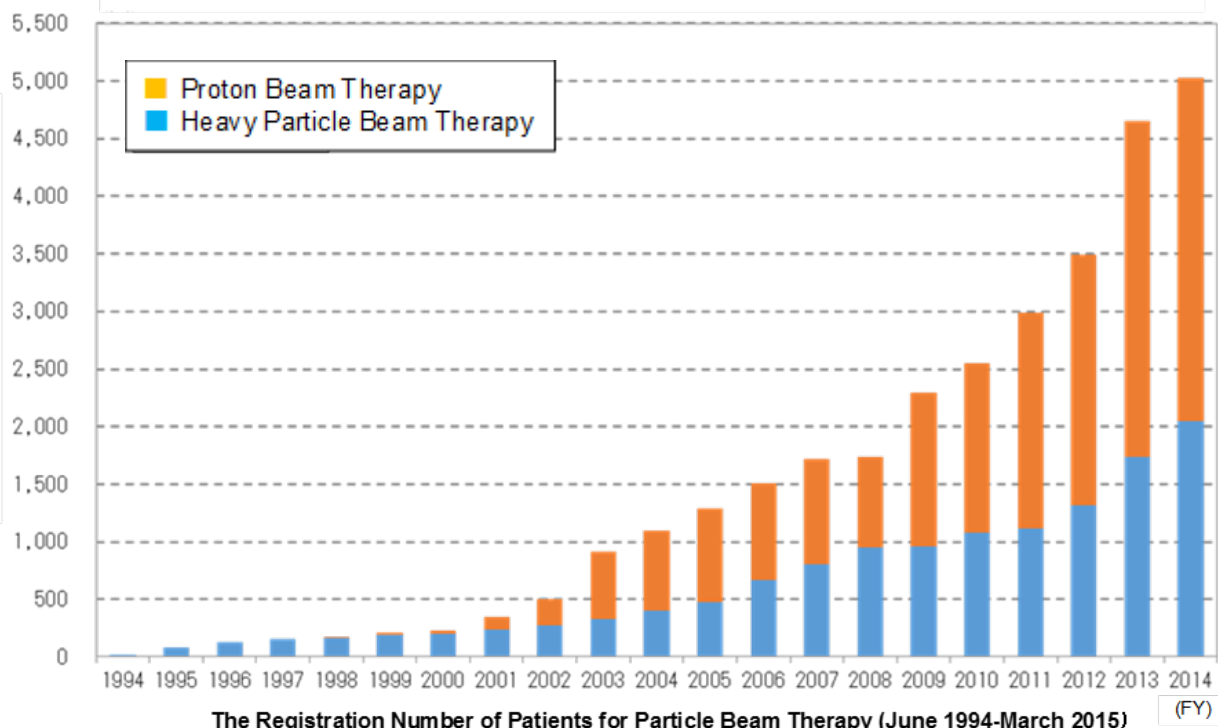
- Japan has developed technologies for the safe handling of radiation and regulations for radiation protection to prevent damage to human health.
- Academic and industrial research and development has gone forward to use the benefits of radiation, and today radiation is effectively used in a wide variety of fields including medicine, industry, agriculture, and science and technology. The aggregate economic value of these applications is calculated at nearly 4 trillion yen.



Japanese Economic Scale of Radiation Utilization in 2015

<ref> handout # 1-1 [Economic Research on Radiation Utilization] provided by the Cabinet Office at the 29th Atomic Energy Committee in 2017

The Registration Number of Patients for Clinical Test and Advanced Medical Treatment

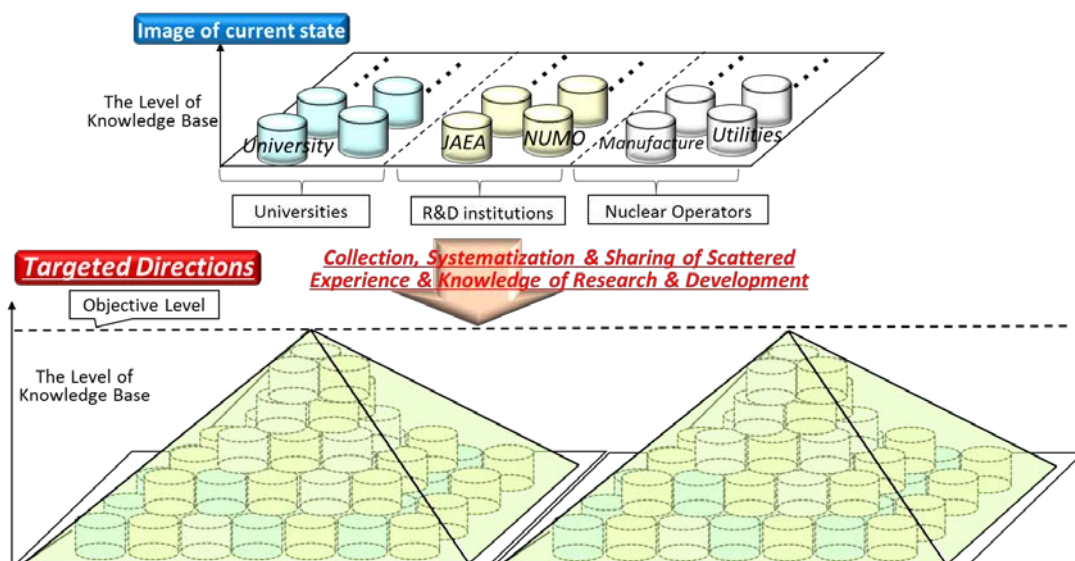


The Registration Number of Patients for Particle Beam Therapy (June 1994-March 2015)

<ref>based on the data: [Registration Number of Patients for Treatment in Particle Beam Facility (By Each FY) in June 2017] by Association for Nuclear Technology in Medicine and [The Registration Number of Patients for Heavy Particle Beam Therapy in NIRS] by National Institutes for Quantum and Radiological Science and Technology- National Institute of radiological Sciences

【Chapter 4】 Nuclear energy research and development

- Japan is promoting research and development related to the decommissioning of the TEPCO Fukushima Daiichi nuclear power plant and measures for its contaminated water and approaches to restoring the contaminated environment, and nuclear safety research. Additionally, grounded on the lessons learned from the accident, it is necessary to proceed with technology development that contributes to improved safety, including measures to deal with severe accidents, and with R&D work that contributes to the disposal of spent fuel and other radioactive waste.
- From the standpoint of the practical application of new nuclear energy science and technology, JAEA is advancing fundamental research and development activities related to nuclear and reactor engineering, fuel and materials, as well as nuclear fusion and high-temperature gas reactor, etc.
- In the area of fast reactor cycle technology, in December 2016, the Fast Reactor Development Council decided to decommission the Monju facility without resuming its operations and to integrate, to the greatest extent possible, the functions of Monju into fast reactor research and development efforts going forward.
- JAEA plans to consolidate and develop priorities for all of their reactors, including research reactors, and to develop plans for safety measures for these facilities.
- In promoting research and development activities, it is vital to develop connections and partnerships between the industries that are introducing new technologies into the market with the research facilities and universities that are creating new knowledge and value. JAEC has pointed out the need for a network that crosses industry and research institutions and universities, and for the establishment of a broad knowledge base.



The image of collaboration & cooperation between R&D institutions & industries

【Chapter 5】 International initiatives

5-1 International cooperation

- Some developed countries continue to use nuclear energy, including nuclear power generation, and some developing countries have introduced and expanded their use of nuclear energy after the Fukushima accident. Given these circumstances, Japan is expected to promote strategic international cooperation and collaboration premised on the peaceful use of nuclear energy, as well as nuclear nonproliferation, nuclear security, and safety and to demonstrate international leadership in nuclear nonproliferation and security.
- In the aftermath of the Fukushima accident, Japan promotes bilateral and multilateral cooperation between the developing countries and developed countries while proactively participating in the work of international organizations.



Cabinet Office Deputy Minister Hiroataka Ishihara speaking at the IAEA

5-2 Maintaining and strengthening nuclear disarmament and nonproliferation regimes

- To create a safer and more peaceful world free of nuclear weapons, Japan is committed to promoting nuclear disarmament diplomacy and striving to maintain and strengthen the international nuclear nonproliferation regime.
- An overview is given of initiatives and recent trends in nuclear nonproliferation including nuclear nonproliferation treaties (NPT), nuclear nonproliferation with respect to North Korea and Iran, and initiatives against nuclear terrorism including nuclear security summits and treaties to protect nuclear material and nuclear energy facilities.

5-3 International use of nuclear energy and industry trends

- Although the Fukushima accident has had an enormous impact on all the countries around the world using nuclear power, many of these countries maintain the policy to continuously use this energy source. An overview of nuclear energy policy and industry trends in the US, UK, China, and other countries is given.
- Given the international presence of Japan's nuclear industry, the Government and businesses must ensure that strict procedures and export controls are firmly in place within the framework of the international nuclear nonproliferation regime. When granting public credit, the Government is committed to assessing whether Japan's trading partners comply with international policies to assure safety and their safety systems are in place domestically, and disclose such information to the public.

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