

1. Location and capability of nuclear facilities

Japan has developed a nuclear program for non-military purposes since the 1950s. Its first commercial reactor began operating in 1966. Due to problems at Tokyo Electric Power Company, with all reactors closed down at one stage, nuclear energy production lowered in 2002, 2003 and 2004. Today, nuclear energy accounts for 30% of Japan's total energy production. Japan has few natural resources of its own, and depends on imports for some 80% of its energy needs. <http://www.world-nuclear.org/info/inf79.html>; <http://www.world-nuclear.org/info/reactors.html>

In April 2006, the Institute of Energy Economics forecast that in 2030 Japan's primary energy demand will decrease 10% while electricity use will increase, and that the nuclear share will be 41%, from 63 GWe of capacity. Ten new units could come on line by 2030.

Also in April 2006, the Tokyo Metropolitan Government issued its Renewable Energy Strategy in an attempt to go beyond the level of pilot projects and increase renewable energy use in the city to 20% of all energy supplies by the year 2020.

In May 2006, the ruling Liberal Democratic Party urged the government to accelerate development of fast breeder reactors (FBRs), calling this "a basic national technology". It proposed a increased budget, better coordination in moving from R&D to verification and implementation, and international cooperation. Japan is already playing a leading role in the Generation IV initiative, with focus on sodium-cooled FBRs, though the 280 MWe Monju prototype FBR remains shut down. <http://www.uic.com.au/nip79.htm>

Power Reactors

Operational: 55
Shut down: 3
Decommissioned: 0
Under Construction: 1
[w.iaea.or.at/programmes/a2/](http://www.iaea.or.at/programmes/a2/)

Research Reactors

Operational: 13
Shut down: 7
Decommissioned: 3
Planned: 0
<http://www.iaea.or.at/worldatom/rrdb/>

Uranium Mines

Japan terminated its domestic uranium exploration program in 1988. Mining interests previously held by the Japanese government abroad are being transferred to the private sector. However, the government will subsidize half the cost of uranium exploration abroad to support private companies for the fiscal year of 2007. US\$8.4 million in subsidies will be provided. Most of the money is directed to deposits in Australia, Canada, and Kazakhstan.

www.e-convention.org/imhc/papers/Sakamaki_e.pdf; <http://www.wise-uranium.org/upasi.html#JP>

Fuel Cycle

Japan has been developing a complete domestic nuclear fuel cycle industry, based on imported uranium. A small uranium refining and conversion plant is operated by Japan Nuclear Cycle Development Institute (JNC), as well as a small centrifuge enrichment demonstration plant, at Ningyo Toge, Okayama prefecture. Most enrichment services are imported, but Japan Nuclear Fuel Ltd (JNFL) operates a commercial enrichment plant at Rokkasho. In December 2004, the reprocessing plant in Rokkasho commenced uranium trials, and is the only large-scale reprocessing plant in the world expected to begin full-scale operations in the near future. <http://www.world-nuclear.org/info/inf79.html>

Reprocessing Plants

Since 1956, the Japanese policy has been to maximize the use of imported uranium, extracting an extra 25-30% of energy from nuclear fuel by recycling the unburned uranium and plutonium as mixed-oxide fuel (MOX).

Until recently, the reprocessing of spent fuel has been done in Europe by British Nuclear Fuel, Ltd (BNFL) and Cogema, with vitrified high-level wastes being returned to Japan for disposal. This co-operation terminated in 2005.

Japan has announced plans to use MOX fuel in 16-18 reactors by the year 2010. Major local protests, however, have prevented this to date. <http://www.world-nuclear.org/info/inf79.htm>;
<http://www.world-nuclear.org/nb/nb05/latestnews.htm>

2. Fissile Material Holdings

Separated Civil Plutonium: 40.6 tons (5.4 tons in-country, 35.2 tons in other countries)

Estimated by 2010: 62 tons (51-64)

Estimated by 2015: 58 tons (24-91)

Estimated by 2020: 50 tons (15-86)

http://www.isis-online.org/global_stocks/end2003/plutonium_watch2005.pdf

The high uncertainty ranges in parenthesis following the projections reflect the uncertain timing of Japan's use of MOX in reactors and the amount of plutonium it plans to separate in the Rokkasho reprocessing plant.

HEU: 2 tons

Supplier: US, UK

http://www.isis-online.org/global_stocks/end2003/civil_heu_watch2005.pdf

Radioactive waste disposal

Low-level waste: The Japan Nuclear Fuel Limited-owned center in Rokkasho works as repository for low-level waste generated at nuclear power plants throughout Japan. The disposal method is shallow burial of the waste in drum cans. <http://cnic.jp/english/topics/cycle/rokkasho/rokkashodata.html#llw>

High-level waste: The high-level waste stored at Rokkasho today is waste produced during reprocessing overseas and returned to Japan, as reprocessing has not yet started at the site. More waste will be returned in the future and more storage space will be required. In March 2001, Japan Nuclear Fuel (JNFL) put forward a proposal to construct an additional interim storage facility at the Rokkasho site to store vitrified high-level waste returned from overseas, as the existing waste storage center will be filled by the end of 2005.

In January 2005, the operating storage was subject to a safety inspection, which found major problems with the cooling system of the vitrified high-level waste storage buildings. Too high a temperature in the storage risks leading to cracks in the glass canisters holding the vitrified waste. <http://cnic.jp/english/newsletter/nit105/nit105articles/nit105glassrok.html>; <http://cnic.jp/english/topics/cycle/rokkasho/rokkashodata.html#reproc>

In June 2000, a law about final disposal of nuclear waste was announced and strategies for the disposal of high-level waste were formulated. In October the same year, authorization was granted to establish the Nuclear Waste Management Organization of Japan (NUMO). NUMO is responsible for identification of the disposal site, construction, operation and maintenance of the repository, closure of the facility and post-closure institutional control. http://www.numo.or.jp/english/jigyuu/new_eng_tab03.html

Construction of a repository in granite or sedimentary rock is planned for the 2030s. NUMO has begun an open solicitation process to find a site, and by 2007 will shortlist potentially suitable offers. The promising ones will be subject to detailed investigation by 2012. A third phase to 2025 will end with site selection. http://www.world-nuclear.org/info/printable_information_papers/inf79print.htm

Renewable Energy: In 2006, renewable energy supplied about 2.7 percent of the total energy demand

from Tokyo's approximately 12.5 million people. Power and heat from waste incineration plants, and solar light and heat are the major sources of renewable energy in the Tokyo metropolitan area. The government has installed several pilot projects: wind generators in the Tokyo waterfront area, and a water treatment plant that uses one of Japan's largest solar generators.

<http://www.ens-newswire.com/ens/apr2006/2006-04-06-05.asp>

3. Nuclear Activities

Research Centers

Central Institute of Isotope Science

CRIEPI: Central Research Institute of Electric Power Industry

Institute of Advanced Energy, Kyoto University

INSAF: International Network for Safety Assurance of Fuel Cycle Industries

JAERI: Japan Atomic Energy Research Institute

JANTI: Japan Nuclear Technology Institute

Kansai Research Establishment

KEK: High Energy Accelerator Research Organization

KENS Neutron Scattering Facility

Kobelco Research Institute

LDRC: Low Dose Radiation Research Center

Musashi Institute of Technology -Atomic Energy Research Institute

NIC: Nuclear Information Center

NIFS: National Institute for Fusion Science

NIRE: National Institute for Resources & Environment

NIRS: Japanese National Institute of Radiological Sciences

NMCC: Nuclear Material Control Center

NUSTEC: Nuclear Safety Technology Center Office of Nuclear Ship Research & Development

Office of Nuclear Ship Research & Development

ReaD: Research and Development Database

RERF: Radiation Effects Research Foundation

RIKEN: Institute of Physical & Chemical Research

SARL: Severe Accident Research Laboratory

SPRING-8 Synchrotron Radiation Facility

SRI: Ship Research Institute

TIARA Research Facilities.

<http://www.radwaste.org/research.htm>

Nuclear Cooperation

France, UK: Reprocessing Japanese spent fuel has been largely undertaken in Europe by BNFL and Cogema. Vitrified high-level wastes are then returned to Japan for disposal.

Plutonium recovered by reprocessing in the UK and France will be used mainly as mixed-oxide (MOX) fuel. Full-scale operation of JNFL's reprocessing plant at Rokkasho started in July 2006. To date, Japan has received four shipments containing over two tons of its reactor-grade plutonium from Europe.

http://www.world-nuclear.org/info/printable_information_papers/inf79print.htm

US: In May, 2004, The US Department of Energy and Japan's Agency for Natural Resources and Energy (ANRE) signed an arrangement to increase nuclear cooperation, focusing especially on light water technologies, processing technologies of oxide fuel for light water reactors, and fuel technologies using solvent extraction and other areas. The US and Japan have also signed a safeguards and non-proliferation agreement, a nuclear technology agreement, and a waste management agreement.

<http://www.ne.doe.gov/ineri/ineriagreementsjapan.html>; <http://www.jaea.go.jp/jnc/jncweb/03inter/03index.html>

In 2007, the United States and Japan will collaborate on a plan to build new nuclear power plants, the

plan will build upon the civilian nuclear energy technical cooperation already underway between the two countries and will include regulatory and nonproliferation-related nuclear exchanges.

The US will also welcome Japanese participation in the \$1 billion FutureGen Project, a United States sponsored initiative to construct the world's first emission-free coal fired electricity generation plant, to be constructed in the United States at a site yet to be selected. The project will employ coal gasification technology integrated with combined cycle electricity generation and the sequestration of carbon dioxide emissions. <http://www.ens-newswire.com/ens/jan2007/2007-01-10-01.asp>

Russia: In February of 2007, Russian Energy Minister Viktor Khristenko and Japanese Foreign Minister Taro Aso agreed to strengthen ties for oil and natural gas development. <http://nuclearno.com/text.asp?11600>

Taiwan: In May 2004, Japan and Taiwan signed an agreement to promote bilateral cooperation in nuclear energy control and safety. <http://www.globalsecurity.org/wmd/library/news/taiwan/2004/taiwan-040526-cna02.htm>

China: In 1994, an agreement on nuclear safety cooperation was signed, in addition to a 1985 nuclear energy cooperation agreement. <http://www.nti.org/db/china/nca.htm>

Canada, France, Germany, Republic of Korea, Russia, Switzerland, UK: Japan has signed several technology and waste management agreements with these countries. <http://www.jaea.go.jp/jnc/jncweb/03inter/03index.html>

Japan has been involved in training nuclear power personnel from Russia, Ukraine, Bulgaria, Hungary and the Czech and Slovak Republics in all aspects of nuclear safety. <http://www.world-nuclear.org/info/inf38.htm>

4. International Non-proliferation Efforts

Japan is also a participant in the G8 Global Partnership against the spread of weapons and materials of mass destruction, launched in Kananaskis, Canada 2002.

Treaties Signed and Ratified, date of deposit

Antarctic Treaty, 4 August 1960
APM Convention, 30 September 1998
Biological Weapons Convention, 8 June 1982
Certain Conventional Weapons Convention, 9 June 1982
Chemical Weapons Convention, 15 September 1995
Comprehensive Nuclear Test Ban Treaty, 8 July 1997
Convention on the Physical Protection of Nuclear Material, 28 October 1988
Nuclear Non-Proliferation Treaty, 8 June 1976
Outer Space Treaty, 10 October 1967
Seabed Treaty, 21 June 1971

Japan ratified the IAEA Additional protocol 16 December 1999.

Multilateral Groups

Australia Group
Conference on Disarmament
Hague Code of Conduct against Ballistic Missile Proliferation
Missile Technology Control Regime
Nuclear Suppliers Group
Proliferation Security Initiative

5. Positions Taken in International Fora on Various Issues of Nuclear Disarmament

FMCT: "Through prohibiting the production of fissile material for nuclear weapons or other explosive devices, an FMCT will not only limit the production of nuclear weapons by the nuclear weapon States, but also prevent the appearance of new nuclear-weapon States. From the twin perspectives of nuclear disarmament and non-proliferation it will become an important milestone. Furthermore, this Treaty will significantly contribute to the stability of the international security environment." - **Statement by Mr. Hamada, Vice-Minister of Foreign Affairs, to the Conference on Disarmament, 13 March 2007.** <http://www.reachingcriticalwill.org/political/cd/speeches07/1session/March13Japan.pdf>

FMCT: "It has been argued, both inside and outside this Conference, that an FMCT that does not cover existing stocks is merely a non-proliferation issue. In order to eliminate nuclear weapons, however, it is absolutely imperative that we end their production and halt the nuclear arms race. Moreover, while the CTBT institutes a qualitative cap, an FMCT will institute a quantitative cap on the production of nuclear weapons. Thus, an FMCT is primarily a measure for nuclear disarmament." - **Statement by Mr. Yoshinobu Hiraishi to the Conference on Disarmament, 6 February 2007.** <http://www.reachingcriticalwill.org/political/cd/speeches07/1session/feb6Japan.pdf>

Nuclear Disarmament: "As the only nation to have experienced devastation of nuclear attack, Japan has placed its greatest importance on nuclear disarmament." - **Statement by Mr. Yoshinobu Hiraishi to the Conference on Disarmament, 6 February 2007.** <http://www.reachingcriticalwill.org/political/cd/speeches07/1session/feb6Japan.pdf>

Nuclear Doctrines: "The nuclear-weapon states should also further reduce the operational status of nuclear weapon systems in ways that promote international stability and security. Diminishing the role of nuclear weapons in security policies is essential to minimizing the risk that these weapons will ever be used, and facilitates the process of their total elimination." - **Statement by Mr. Yoshinobu Hiraishi to the Conference on Disarmament, 6 February 2007.** <http://www.reachingcriticalwill.org/political/cd/speeches07/1session/feb6Japan.pdf>

Disarmament Education: "As part of our long term efforts toward nuclear disarmament, Japan attached great importance to disarmament and non-proliferation education... Furthermore, Japan highly values the work of civil society in disarmament and non-proliferation education and intends to continue its close cooperation with their activities." - **Statement by Mr. Yoshinobu Hiraishi to the Conference on Disarmament, 6 February 2007.** <http://www.reachingcriticalwill.org/political/cd/speeches07/1session/feb6Japan.pdf>

Non-Governmental Organizations: "First of all I would like to express my appreciation for today's NGO presentations on various disarmament issues. Japan highly values the activities by civil society, and continues to closely cooperate with NGOs. Today I would like to take this opportunity to touch upon disarmament and non-proliferation education, as NGOs play a significant role in this field." - **Statement by H.E. Mr. Yoshiki Mine to the First Committee on Disarmament and International Security, 19 October 2006.** <http://www.reachingcriticalwill.org/political/1com/1com06/statements/Japanoct19.doc>