

# JAPAN

## 1. LOCATION AND CAPABILITY OF NUCLEAR FACILITIES

Japan has developed a nuclear program for non-military purposes since the 1950s. 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. In 2003, nuclear energy accounted for 26.6% of 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.htm>; <http://www.world-nuclear.org/info/reactors.htm>

### Power Reactors

Operational: 53

Shut down: 2

Decommissioned: 3

Planned: 12

<http://www.iaea.or.at/programmes/a2/>

### Research Reactors

Operational: 15

Shut down: 6

Decommissioned: 3

Planned: 0

<http://www.iaea.or.at/worldatom/rrdlb/>

### 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.

[www.e-convention.org/imhc/papers/Sakamaki\\_e.pdf](http://www.e-convention.org/imhc/papers/Sakamaki_e.pdf)

### 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.htm>

### 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).

Up 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 is scheduled to terminate in 2005

Japan has announced plans to use MOX fuel in 16-18 reactors by the year 2010. Recent local concerns about MOX fuel use, related to its plutonium content, have stalled the implementation of the program. <http://www.world-nuclear.org/info/inf79.htm>; <http://www.world-nuclear.org/nb/nb05/latestnews.htm>

## 2. FISSILE MATERIAL HOLDINGS

### Unirradiated Civil Plutonium

In country: 5.475 tons

In other countries: 35.168

Total: 38.6

### Separated Civil Plutonium

end 2002: 40.643

2010 (projected): 40-60

2015 (projected): 20-80

2020 (projected): 15-80

The ranges 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.

[http://www.isis-online.org/global\\_stocks/separated\\_civil\\_pu.html](http://www.isis-online.org/global_stocks/separated_civil_pu.html)

### 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 plays a key role in the high-level waste disposal project and 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](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](http://www.world-nuclear.org/info/printable_information_papers/inf79print.htm)

## 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

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. This reprocessing will finish in 2005. Full-scale operation of JNFL's reprocessing plant at Rokkasho is scheduled to start 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](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 innovative light water technologies, innovative processing technologies of oxide fuel for light water reactors, and innovative fuel technologies using solvent extraction and other areas.

<http://www.ne.doe.gov/ineri/ineriagreementsjapan.html>

*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>

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**

APM Convention, 30 September 1998  
Biological Weapons Convention, 8 June 1982  
Certain Conventional Weapons Convention, 9 June 1982  
Comprehensive Nuclear Test Ban Treaty, 8 July 1997  
Chemical Weapons Convention, 15 September 1995  
Nuclear Non-Proliferation Treaty, 8 June 1976  
Outer Space Treaty, 10 October 1967

Sea Bed Treaty, 21 June 1971

Japan ratified the IAEA Additional protocol 16 December 1999.

### Multilateral Groups

Conference on Disarmament

Hague Code of Conduct against Ballistic Missile Proliferation

Missile Technology Control Regime

Nuclear Suppliers Group

Proliferation Security Initiative

Wassenaar Arrangement

Zangger Committee

## 5. POSITIONS TAKEN IN INTERNATIONAL FORA ON VARIOUS ISSUES OF NUCLEAR DISARMAMENT

*Disarmament and Universality:* “Nuclear non-proliferation and nuclear disarmament are mutually reinforcing, hence both need to be promoted. Both Nuclear Weapon States and Non-Nuclear Weapon States must remain fully committed to their obligations and commitments under the NPT. In order to achieve universality of the Treaty, Japan calls upon states not parties to the NPT to accede to it as Non-Nuclear Weapon States without conditions and without delay.” - **Statement by H.E. Mr. Yoshiki Mine to the 59th Session of the General Assembly First Committee on Disarmament and International Security, 18 October 2004 .**

<http://www.reachingcriticalwill.org/political/lcom/lcom04/thematic/japan.pdf>

*Fissile Material Treaty:* “It is also cause for regret that the Conference on Disarmament (CD) has not yet commenced negotiations on a fissile material cut-off treaty (FMCT) despite the conclusion of the 2000 NPT Review Conference. Placing a global ban on the production of fissile material for nuclear weapons is the most effective way to prevent proliferation. Also will it enhance transparency and accountability in the management of such materials through its verification system. Thus, the FMCT will be an essential building block towards the total elimination of nuclear arsenals and will also contribute to the prevention of nuclear proliferation.” - **Statement by H.E. Mr. Yoshiki Mine to the Third Preparatory Committee of the 2005 NPT Review Conference, 30 April 2004.**

<http://www.reachingcriticalwill.org/legal/npt/prepcom04/japanCLI.pdf>

*Disarmament Education:* “I would like to stress the importance of disarmament and non-disarmament education. In the current unsettled security environment, there is a clear need to inform people of the dangers posed by weapons of mass destruction and their disastrous consequences, as evidenced by the devastation of Hiroshima and Nagasaki. In order to advance disarmament and non-proliferation, it is essential to gain the understanding and support of the young people who will lead future generations, as well as of civil society as a whole.” -**Statement by H.E. Mr. Yoshiki Mine to the Third Preparatory Committee of the 2005 Review Conference, 3 May 2004.**

<http://www.reachingcriticalwill.org/legal/npt/prepcom04/japan3.pdf>