



Japan's New Policy on Nuclear Energy

Prelims: Nuclear Energy, Nuclear Power Plants, Uranium-235, India-U.S. civil nuclear deal.

Mains: Prospect of India's Nuclear Energy.

Why in News?

Recently, Japan has adopted a new policy **promoting greater use of [Nuclear Energy](#) to ensure a stable power supply** amid global fuel shortages and to reduce carbon emissions.

What is Japan's New Policy?

- It is Japan's major **reversal of its nuclear phase-out plan** following the Fukushima crisis in 2011.
 - **Fukushima accident** caused by Tsunami in 2011 was the **second worst nuclear accident in the history of nuclear power generation**. The site is on Japan's Pacific coast, in northeastern Fukushima prefecture about 100 km south of Sendai.
- The Policy seeks to **maximize the use of existing nuclear reactors by restarting as many of them as possible** and prolonging the operating life of old reactors beyond their 60-year limit, and by developing next-generation reactors to replace them.
- It pledges to sustain use of nuclear power into the future. Most nuclear reactors in Japan are more than 30 years old.
- It aims to push for the **development and construction of "next-generation innovative reactors"** with safer features to replace about 20 reactors now set for decommissioning.
 - Nuclear energy **accounts for less than 7% of Japan's energy supply**, and achieving the government's goal of raising its share to 20-22% by fiscal 2030 will require about 27 reactors, from the current 10.

What is the Prospect of India's Nuclear Energy?

- **Status of Nuclear Energy:**
 - Nuclear energy is the **fifth-largest source of electricity for India**. India has over 22 nuclear reactors in 7 power plants across the country which produces 6780 MW of nuclear power. The 7 power plants are:
 - Tarapur Atomic Power Station (TAPS), Maharashtra.
 - Kudankulam Nuclear Power Station (KKNPS), Tamil Nadu
 - Kakrapar Atomic Power Station (KAPS), Gujarat.
 - (Kalpakkam) Madras Atomic Power Station (MAPS), Tamil Nadu.
 - Narora Atomic Power Station (NAPS), Uttar Pradesh.
 - Kaiga Generating Station (KGS), Karnataka.
 - **Rajasthan Atomic Power Station (RAPS)**, Rajasthan.
 - The public sector entity, **[Nuclear Power Corporation of India \(NPCIL\)](#)**, is responsible for designing, building, commissioning and operating nuclear power reactors in the country.
 - NPCIL operates under the **Indian government's Department of Atomic Energy**

(DAE).

▪ **Significance for India:**

- **Availability of Thorium:** India is the **leader of the new resource of nuclear fuel called Thorium**, which is considered to be the nuclear fuel of the future.
 - With the availability of Thorium, India has the potential to be the first nation to realise the dream of a fossil fuel-free nation.
- **Cuts Import Bills:** Nuclear energy will **also relieve the nation of about USD 100 billion annually** which we spend on importing petroleum and coal.
- **Stable and Reliable Source:** The greenest sources of power are **definitely solar and wind. But solar and wind power, despite all their advantages, are not stable** and are dependent excessively on weather and sunshine conditions.
 - Nuclear power, on the other hand, provides a **relatively clean, high-density source of reliable energy** with an international presence.
- **Cheaper to Run:** Nuclear power plants are cheaper to run **than their coal or gas rivals**. It has been estimated that even factoring in costs such as managing radioactive fuel and disposal nuclear plants cost between 33 to 50% of a coal plant and 20 to 25% of a gas combined-cycle plant.

▪ **Challenges:**

- **Insufficient Nuclear Installed Capacity:** In 2008, the Atomic Energy Commission projected that India would have 650GW of installed capacity by 2050; the current installed capacity is only 6.78 GW.
 - Such targets were based on the expectation that India would import many light-water reactors after the [India-U.S. civil nuclear deal](#). But the deal has not led to the establishment of a single new nuclear plant, over 13 years after it was concluded.
- **Lack of Public Funding:** Nuclear power has never received the quantum of generous subsidy the fossil fuel received in the past and renewable is receiving currently.
 - In absence of public funding, nuclear power will find it tough to compete against natural gas and renewables in the future.
- **Acquisition of Land:** Land acquisition and selection of location for Nuclear Power Plant (NPP) is also a major problem in the country.
 - NPP's like [Kudankulam in Tamil Nadu](#) and Kovvada in Andhra Pradesh have met with several delays due to the land acquisition related challenges.
- **Impact of Climate Change:** Climate change will increase the risk of nuclear reactor accidents. During the world's increasingly hot summers, several nuclear power plants have already had to be temporarily shut down or taken off the grid.
 - Further, nuclear power plants depend on nearby water sources to cool their reactors, and with many rivers drying up, those sources of water are no longer guaranteed.
- **Deployment at Insufficient Scale:** It might not be the appropriate choice for mitigating [India's carbon emissions](#) since it cannot be deployed at the necessary scale.
- **Nuclear Waste:** Nuclear waste can have drastically bad effects on life, causing cancerous growths, for instance, or causing genetic problems for many generations of animals and plants.
 - In a densely populated country such as India, land is at a premium and emergency health care is far from uniformly available.

What are India's Initiatives Regarding Nuclear Energy?

▪ [Three-stage Nuclear Power Programme:](#)

- India has **consciously proceeded to explore the possibility of tapping nuclear energy for the purpose of power generation**.
- In this direction a **three-stage nuclear power programme** was formulated by Homi Bhabha in the 1950s.

▪ **The Atomic Energy Act, 1962:**

- The Atomic Energy Act, 1962 was framed and **implemented with the set objectives of using two naturally occurring elements [Uranium](#) and Thorium as nuclear fuel in Indian Nuclear Power Reactors**.

▪ [Pressurised Heavy Water Reactors:](#)

- In December, 2021, the Government of India informed Parliament about building ten indigenous **Pressurised Heavy Water Reactors (PHWRs)** to be set up in fleet mode and had granted “in principle approval” for 28 additional reactors, including 24 to be imported from France, the U.S. and Russia.
- **Nuclear power reactors at Jaitapur in Maharashtra:**
 - Government has given in-principle (first step) approval for setting up of **six nuclear power reactors at Jaitapur in Maharashtra.**
 - Jaitapur would be the world’s most powerful nuclear power plant. There would be six state-of-the-art Evolutionary Power Reactors (EPRs) with an installed capacity of 9.6 GWe that will produce low carbon electricity.
 - The six nuclear power reactors, which will have a capacity of 1,650 MW each, will be set up with technical cooperation from France.

Way Forward

- The global energy crisis should spur a **rational relook at an energy source as clear as nuclear which** needlessly seen as a hot potato.
 - We must make the right choices between various low-carbon technologies, all of which have some social and environmental impact.
- To meet rising energy demands, **nuclear power is one of the better solutions.**
- Considering lower capacity utilisation of renewables, **rising fossil fuel prices and ever soaring pollution problems**, the potential of nuclear power must be fully exploited.

UPSC Civil Services Examination, Previous Year Questions (PYQs)

Prelims

Q. The function of heavy water in a nuclear reactor is to (2011)

- (a) Slow down the speed of neutrons
- (b) Increase the speed of neutrons
- (c) Cool down the reactor
- (d) Stop the nuclear reaction

Ans: (a)

Exp:

- **Heavy water (D₂O), also called Deuterium Oxide**, is water composed of Deuterium (Hydrogen isotope) **with a mass double that of regular water (H₂O).**
- Heavy water occurs naturally, although it is much less common than regular water.
- It is commonly **used in nuclear reactors as a neutron moderator**, i.e., to slow down the speed of neutrons.
- **Therefore, option (a) is the correct answer.**

Mains

Q. With growing energy needs should India keep on expanding its nuclear energy programme? Discuss the facts and fears associated with nuclear energy. (2018)

Source: IE

PDF Refernece URL: <https://www.drishtias.com/printpdf/japan-s-new-policy-on-nuclear-energy>