

7. Shanti Bill- Economy

SHANTI Bill spurs private sector to make, run nuclear plants. The Union Cabinet has recently approved the Sustainable Harnessing and Advancement of Nuclear Energy for Transforming India (SHANTI) Bill. This landmark legislation aims to overhaul India's nuclear governance structure and, for the first time, open the highly restricted nuclear power sector to private companies, marking a significant shift from the state-monopoly model.

Key Provisions of the SHANTI Bill

The Bill proposes transformative changes to the Atomic Energy Act, focusing on privatization, foreign investment, and regulatory restructuring.

Ending State Monopoly

Current Status- The Atomic Energy Act currently bars private entities and state governments from operating nuclear plants. The Nuclear Power Corporation of India Limited (NPCIL), a PSU under the Department of Atomic Energy (DAE), is the sole operator managing all 24 commercial reactors.

Proposed Change- The Bill allows private entities to operate nuclear power plants, albeit under strict government oversight.

Foreign Direct Investment (FDI) Push- To attract global technology and capital, the Bill permits up to 49% Foreign Direct Investment (FDI) in specific nuclear activities.

Legal & Regulatory Overhaul

Civil Liability Amendment- It proposes amending the Civil Liability for Nuclear Damage Act, 2010 to shield plant operators and cap the liability of equipment suppliers—a long-standing demand of international suppliers.

Insurance Redesign- It restructures operator insurance under the Indian Nuclear Insurance Pool, setting a coverage cap of ₹1,500 crore per incident.

Dispute Resolution- Establish a specialized nuclear tribunal to handle legal disputes efficiently.

Strategic Safeguards- While operations may be privatized, Core Functions—specifically nuclear material production, heavy water production, and waste management—will remain exclusively with the Department of Atomic Energy (DAE) to ensure national security.

Significance of Private Sector Participation

Opening the sector is a strategic move to accelerate capacity addition and modernization.

Resource Mobilisation- Nuclear projects are extremely capital-intensive. Private participation opens avenues for domestic and global capital, significantly reducing the fiscal burden on the government.

Technological Innovation- Private firms are expected to bring in advanced reactor designs (like SMRs), modern construction techniques, and higher operational efficiencies, aiding industrial decarbonization.

Energy Security- A diversified ecosystem creates robust supply chains and enhances manufacturing capacity, essential for **long-term low-carbon energy security**.

Challenges and Concerns

The transition from a state monopoly to a mixed model faces significant hurdles.

Safety and Liability Issues- The Civil Liability for Nuclear Damage Act, 2010 places high liability on suppliers, which has historically deterred foreign investment (e.g., Westinghouse, GE). Amending this without compromising victim compensation is legally complex.

Security Risks- Nuclear technology involves sensitive materials (uranium/plutonium). Privatization necessitates stringent safeguards, surveillance, and traceability to prevent proliferation or theft, posing a challenge for national security agencies.

Economic Viability

Gestation Period- Nuclear plants take 8–10 years to construct. Without risk-sharing mechanisms or viability-gap funding, private investors may find the Returns on Investment (ROI) unattractive.

Regulatory Capacity- The shift requires a robust framework to coordinate between civilian operators and security agencies, ensuring accountability mechanisms are foolproof.

Understanding Nuclear Energy in India

Basics

Definition- Energy released from the nucleus of an atom through Fission (splitting heavy nuclei like Uranium) or Fusion (combining light nuclei).

Role- It acts as a high-density, low-carbon baseload power source, crucial for balancing intermittent renewables like solar and wind.

Current Status & Statistics

Installed Capacity- India has 25 operational reactors with a total capacity of approximately 8.88 GW (under 8 GWe).

Expansion- 17 reactors are currently under construction.

Global Comparison

1. USA- 100 GWe (Highest)
2. France- 65 GWe
3. China- 58 GWe

Strategic Importance

Climate Goals- Essential for India's commitment to achieving Net-Zero emissions by 2070.

Future Targets- Scaling up is vital to meet the government's ambitious target of 100 GW nuclear capacity by 2047.

Nuclear Energy Mission and R&D

The government is also focusing on indigenous technology development alongside policy reforms.

Small Modular Reactors (SMRs)- The Nuclear Energy Mission has allocated ₹20,000 crore for R&D.

Goal- To operationalize five indigenously developed SMRs by 2033. SMRs are smaller, safer, and easier to construct than conventional large reactors.

Way Forward

The SHANTI Bill represents a "1991 moment" for India's nuclear sector. To succeed, the government must balance commercial attractiveness for private players with uncompromising safety standards and national security protocols. Strengthening the Atomic Energy Regulatory Board (AERB) to oversee private operators will be critical for public trust.

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