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MP-IDSA
Commentary

Opening up India's Nuclear Energy Sector

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Summary

The shift away from a state-dominated nuclear governance framework towards an investment-friendly regime could enable the Indian nuclear industry to prosper.

Over the last few years, India has gradually opened strategic sectors to private investments. Sectors such as defence manufacturing, space, civil aviation, biotechnology and telecommunications are now open to private investment. A clear policy focus is evident on liberalisation in strategic sectors through increased foreign direct investment (FDI) limits, push for indigenous manufacturing in the defence sector, the opening of defence corridors, and the opening of the Indian Space Research Organisation (ISRO) facilities to private players. Also, private participation is encouraged in the mining and strategic minerals sectors.

The government has issued guidelines, including the National Geospatial Policy (2022), the Indian Space Policy (2023), and the BioE3 Policy (2024). Innovation and technology-centric missions to drive frontier research have been announced. They include National Supercomputing Mission (NSM, 2015), Atal Innovation Mission (AIM, 1.0, 2016) and (AIM, 2.0, 2024), National Mission on Interdisciplinary Cyber-Physical Systems (NM-ICPS, 2018), India Semiconductor Mission (ISM, 2021), Deep Ocean Mission (DOM, 2021), National Quantum Mission (NQM, 2023), and IndiaAI Mission (2024).[1]

The government has now taken the next step towards a 'transformative' overhaul of India's nuclear energy sector. On 15 December 2025, the government tabled the Sustainable Harnessing and Advancement of Nuclear Energy for Transforming India (SHANTI) Bill 2025 in the Lok Sabha. This bill proposes a comprehensive overhaul of India's civil nuclear framework. For all these years, there has been a state monopoly in India's nuclear energy sector. The agenda is to ensure a level playing field for various private agencies when investing in the nuclear industry.

India aims to achieve 100 gigawatts (GW) of nuclear power capacity by the centenary of its independence in 2047. At present, the state operates 25 nuclear reactors with a combined installed capacity of 8,880 megawatts (MW), and 17 additional reactors are under construction. The near-term goal is to raise nuclear capacity to 22,000 MW by 2032. During the 2025 budget speech, Finance Minister Nirmala Sitharaman unveiled a Rs 20,000 crore outlay for the research and development of Small Modular Reactors (SMRs), with a target to operationalise at least five indigenously developed SMRs by 2033. Also, 49 per cent FDI has been allowed for this sector.[2]

[1] **"India's Leap in Research and Innovation"**, Press Information Bureau, Government of India, 4 November 2025.

[2] **"Cabinet Clears SHANTI Bill To Allow Private Players In Nuclear Energy Field"**, *NDTV*, 12 December 2025.

As of June 2025, India's total installed power capacity stands at 476 GW, led by 240 GW of thermal, 110.9 GW of solar, and 51.3 GW of wind. In this power capacity mix, the nuclear component accounts for only 3 per cent. Investment in the nuclear sector is expected to play a significant role in advancing India's decarbonisation goals and its commitment to a sustainable future, particularly in meeting the country's global commitment to achieve net-zero carbon emissions by 2070.[3]

The SHANTI Bill, 2025, would abolish the Atomic Energy Act, 1962 and the Civil Liability to Nuclear Damage Act, 2010. The idea is to have a single, unified law for nuclear energy. Both laws have outlived their original context and were framed for a different era and set of needs. India's Atomic Energy Act 1962 is widely regarded as having established a state monopoly over nuclear power. Obviously, this state dominance has failed to attract significant foreign investment. The law restricts reactor ownership to government entities such as the Nuclear Power Corporation of India Limited (NPCIL).

There was limited scope for private industry to meaningfully enter the nuclear energy market. Owing to bureaucratic delays in land acquisition (mainly due to public opposition in many places) and other required clearances, the presence of a somewhat weak regulatory authority, such as the Atomic Energy Regulatory Board (AERB), and structural and financial challenges restricted the growth of the nuclear sector in the country. In the current era, given that the availability of strategic minerals has become critically important, state control over the mineral sector is increasingly problematic, as it can limit timely access to resources.[4]

The other bill, which requires a change, is India's Civil Liability for Nuclear Damage Act (CLNDA), 2010. This act places its primary emphasis on ensuring prompt and assured compensation to victims of a nuclear incident. As per the law, there is a clear liability framework centred on the operator. It requires financial security to ensure funds are available and provides for government intervention beyond the operator's liability cap. Here, the idea is to protect public interests in the event of a significant accident.

In all fairness, this act was enacted to ensure public safety and improve accountability. However, some clauses in this act allow the operator recourse against suppliers for defective equipment or gross negligence. Also, there is a provision that permits claims under other laws in addition to the act. This exposes suppliers to potentially unlimited and uninsurable liability. This has deterred both

[3] **"India's Energy Landscape: Powering Growth with Sustainable Energy"**, Press Information Bureau, Government of India, 22 June 2025.

[4] **"The Atomic Energy Act, 1962"**, Atomic Energy Regulatory Board, 15 September 1962.

Indian and foreign suppliers, and for years, there has been reluctance to enter this business. This has slowed down India's nuclear energy expansion programme. Also, this act is not in line with the Convention on Supplementary Compensation for Nuclear Damage (CSC), which is a key international norm that establishes a global legal framework for prompt and adequate compensation for victims of a nuclear accident.[5]

India's nuclear sector has faced persistent challenges owing to India being a nuclear-weapon state (NWS) outside the Nuclear Non-Proliferation Treaty (NPT) mechanism. It has not been a part of the global nuclear order for decades. The country was under international sanctions for many years, and in nuclear and other scientific fields, no technology transfer was possible. This forced India to pursue a largely indigenous and resource-constrained nuclear programme. Finally, the India–US civil nuclear deal (2008) broke the impasse. The Nuclear Suppliers Group (NSG) waiver has eased some restrictions. Yet over the last decade and a half, little progress has been made in substantive international nuclear cooperation. No significant investments or technology transfers have materialised, and joint ventures have largely failed to take off, possibly due to problematic and ambiguous legal and regulatory structures.

Over the last 10 to 15 years, India has continued to face limitations in fully integrating into global nuclear commerce, including hurdles in modern reactor technology transfers and in attracting investment. It is now expected that a shift away from a tightly controlled, state-dominated nuclear governance framework towards a more transparent and investment-friendly regime will enable the Indian nuclear industry to prosper.

[5] **"The Civil Liability for Nuclear Damage Act, 2010"**, *India Code*, 21 September 2010; **"Convention on Supplementary Compensation for Nuclear Damage"**, International Atomic Energy Agency (IAEA).

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