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ROADMAP TO A NUCLEAR-POWERED 2047

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In May 2025, there were promising reports indicating that the government was likely to present two crucial amendments in the laws that govern the nuclear sector of the country in the monsoon session of the Parliament, held from July to August 2025.¹ Amending the Atomic Energy Act of 1962 and the Civil Liability for Nuclear Damage Act (CLNDA) of 2010 is a key step in paving the way for the private sector participation, including that by foreign players, in India's state-monopolised nuclear industry. Currently, these laws restrict ownership of nuclear facilities to government entities, and allow for the possibility of the operators to seek legal recourse from their suppliers in the event of an accident because of faulty equipment or services by third parties respectively.

The decision to involve the private sector in India's nuclear industry comes against the backdrop of the new Nuclear Energy Mission, announced during the 2025-26 Union Budget.² Backed by an allocation of INR 20,000 crore, this new initiative has set an ambitious target of achieving 100 GW of nuclear power by 2047, the country's centennial year of independence. With a current output of just 8,780 MWe across 24 reactors,³ it was recognised that the government cannot achieve this massive leap on its own. The private sector is expected to play a significant role in bridging this gap, but the first step is to amend the restrictive legislative

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framework that currently inhibits its participation.

It was expected that the amendment bills would be presented in the monsoon session of the Parliament, but this was, however, not the case. The bills were also absent from the agenda items released by the Lok Sabha for the session. Government officials stated that the amendments are still being reviewed, noting that “as of now, the Bills have not taken a final shape. These are serious laws where the safety aspect has to be kept in mind while drafting each clause. A draft framework was ready, but substantial reviews are currently underway.”⁴

On the CLNDA, an official stated that “there is no consensus on the CLND Act till now. The suppliers need clarity on the extent of the liability they need to bear in the event of an accident and whether it can be passed on to sub-suppliers... Clarity is being sought in this aspect as well. They want to know to what extent the right to recourse can be exercised.”⁵ One issue that is yet to be resolved is how private participation, which is expected to also rely on imported reactors, would extend questions of liability beyond the state-run Nuclear Power Cooperation of India (NPCIL) to foreign technology and design partners, and how liability in the event of an accident will be shared across the value chain.

The Opposition has been quick to question the delay. Jairam Ramesh, the Congress General Secretary responsible for communications, asked the government about this on X (formerly Twitter), pointing out that although the 2025-26 Budget had promised to amend the two acts, no such bills had been introduced during the recently concluded parliamentary session. He also asked about a bill to establish an independent regulatory body outside the atomic energy establishment, which he stated was crucial to encouraging private investment.⁶ A Bloomberg report from August 22 quotes Anil Parab, a whole-time director at the Indian engineering firm Larsen & Toubro Ltd., as saying that even small deviations can delay nuclear projects by months and increase costs⁷ – although it is unclear whether this statement relates to the delay in presenting the amendment bills.

What is clear, however, is that the wave of optimism surrounding the Union Budget announcement in February 2025 cannot be sustained without clear communication on the progress of government efforts towards meeting the goal of 100 GWe. On the amendments,

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given the scope of review and consultations required, it is understandable that the government may need time. Still, sharing even a broad timeline would go a long way in encouraging preparedness and appropriately managing expectations. Simply put, while the public does not need to know the details of ongoing negotiations and internal discussions,

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a regular update on the progress of proposed changes and initiatives (including delays) would be helpful in maintaining confidence.

In response to a question raised in Parliament regarding the details of India's energy roadmap, strategies for leveraging indigenous development and international collaboration on reactors and fuel were shared in July 2025.⁸ While this is a step in the right direction, further clarification is required on the following: whether the private sector will be/has been involved in the ongoing regulatory process of the proposed changes, and to what extent, whether a bill to establish an independent regulatory authority outside the Department of Atomic Energy will be introduced, and whether the amendment bills will be presented in the upcoming winter session of Parliament in November.

In his Independence Day address on August 15, the Prime Minister highlighted India's nuclear plans to achieve the goal of *Viksit Bharat* (developed India) – a future where India increases its nuclear energy capacity more than tenfold and is self-reliant in energy.⁹ More recently, India conveyed these developments in its national statement at the 69th General Conference of the International Atomic Energy Agency (IAEA): “In January 2025, the Government of India launched the Nuclear Energy Mission for *Viksit Bharat* with a target to increase its nuclear power capacity to 100 GW by 2047. This signals a clear priority of the government in placing nuclear energy as a central pillar in India's growth story. To achieve this goal, strategic policy interventions and infrastructure investments are being undertaken, with an emphasis on development and deployment of indigenous nuclear technologies and public-private collaborations.”¹⁰

While the commitment is undoubtedly in place, steady progress on action items and relevant communication is now needed, even in the face of any delays. In order to turn the current ambitious proposal into a realistic and exciting possibility, the government must consider the

The Nuclear Energy Mission for *Viksit Bharat* signals a clear priority of the government in placing nuclear energy as a central pillar in India's growth story.

following aspects in a timely manner:

1. Involve the private sector in the in the regulatory process on the progress of proposed changes to avoid any obstacles and confusion at a later stage.
2. Begin conversations with the Opposition party about the proposed amendments to ensure there is adequate time for review and discussions. It is very likely the introduction of the bills will result in discussions in the Parliament, on several topics that have already been hotly debated in the past. While the government does not, in principle, need to look across the aisle for support, generating political consensus would ensure smooth and timely passage of the bills. Conversations would therefore need to begin right at the outset.
3. Urgently consider establishing an independent regulatory authority – either by clarifying the Atomic Energy Regulatory Board’s (AERB) independence or by establishing a new regulatory authority – as private players and international collaborators enter the nuclear sector. Begin a review of approximately when such a bill could be tabled in Parliament, or share relevant details if such a review is already underway.
4. Formulate entry norms for private companies to engage in nuclear commerce in India based on financial strength, technical capabilities, project experience, sustained revenue performance.¹¹
5. Streamline regulatory clearances, processing timelines, and standardise documentation.
6. Submit the concept design the of the Bharat Small Modular Reactor (BSMR) for regulatory approval and consider incorporating Safeguards by Design in order to enhance its export attractiveness.
7. Review implementation of safety, security and safeguards or 3S of all nuclear facilities and materials, fuel procurement/fabrication, radioactive waste management, decommissioning, and relevant training of the private sector in this regard. Due to the potential proliferation hazards arising from private participation, most of these aspects must remain either exclusively under the purview of the government or with extensive government oversight. Training of private players will still be essential.

8. Fast-track the process of brownfield expansions, while also actively identifying new greenfield sites for future projects.
9. Parallely strategise shifting from uranium to thorium in wake of uncertain global uranium supply.¹² This would not only meet India's energy requirement but also create a global export opportunity.¹³
10. Continue to prioritise educating, training and certifying a capable workforce.
11. Develop/update a comprehensive stakeholder engagement programme based on the IAEA's five key principles for effective engagement: building trust, demonstrating accountability, exhibiting openness and transparency, practising early and frequent consultation; and communicating the benefits and risks of the nuclear technology.¹⁴ Maintaining a social license is essential for the success of a country's nuclear programme.

Encouragingly, the government is already reviewing many of these points in various capacities. For now, much will depend on whether the amendments are introduced in the upcoming winter session of the Parliament and how the debate around them unfolds. More broadly, what will matter in the coming months is not only the pace of developments, but also how consistently it is maintained and communicated to relevant stakeholders. In an almost unexpected and welcome announcement of the Nuclear Energy Mission, the government recognised that such an initiative must be approached with the help of the private sector. Indeed, the entire ecosystem – from government and private industry to civil society, academia, the public, and local populations – will need to galvanise in support of this massive undertaking to join the current global nuclear renaissance. India may finally be ready for its new nuclear age.

Notes:

¹ Anil Sasi, "In Nuclear Energy Push, Govt to Allow Private Operators, Limit Their Liability," *Indian Express*, May 19, 2025, <https://indianexpress.com/article/india/in-nuclear-energy-push-govt-to-allow-private-operators-limit-their-liability-amendments-likely-in-monsoon-session-10014675/>. Accessed on September 17, 2025.

² Press Information Bureau, Department of Atomic Energy, Government of India, "Nuclear Power in Union Budget 2025-26," February 3, 2025, <https://www.pib.gov.in/PressReleasePage.aspx?PRID=2099244>. Accessed on September 17, 2025.

³ Department of Atomic Energy, Government of India, "Roadmap for India's Energy Sector through Nuclear Power," Lok Sabha Unstarred Question No. 558, July 23, 2025, <https://cdnbbsr.s3waas.gov.in/.../202508111697044173.pdf>. Accessed on September 17, 2025.

⁴ Sweta Goswami, "Amendments to Nuclear Laws Still in the Works, Unlikely this Monsoon Session," *Moneycontrol*, July 16, 2025, <https://www.moneycontrol.com/news/power/amendments-to-nuclear-laws-still-in-the-works-unlikely-this-monsoon-session-13286324.html>. Accessed on September 18, 2025.

⁵ Ibid.

⁶ Jairam Ramesh (@Jairam_Ramesh), X (Twitter), August 26, 2025, https://x.com/Jairam_Ramesh/status/1960185108121469038. Accessed on September 18, 2025.

⁷ Rajesh Kumar Singh, "Indian Energy Giants Rally Behind Nuclear in Clean Power Push," *Bloomberg*, August 22, 2025, <https://www.bloomberg.com/news/articles/2025-08-22/indian-energy-giants-rally-behind-nuclear-in-clean-power-push?embedded-checkout=true>. Accessed on September 18, 2025.

⁸ Lok Sabha, Government of India, "Roadmap for India's Energy Sector through Nuclear Power," Lok Sabha Unstarred Question No. 558, July 23, 2025, https://sansad.in/getFile/loksabhaquestions/annex/185/AU558_1qtUxo.pdf?source=pqals. Accessed on September 18, 2025.

⁹ "Modi Highlights India's Nuclear Plans on Independence Day," *World Nuclear News*, August 15, 2025, <https://www.world-nuclear-news.org/articles/modi-highlights-indias-nuclear-plans-on-independence-day>. Accessed on September 18, 2025.

¹⁰ Department of Atomic Energy, Government of India, "Statement by Dr Ajit Kumar Mohanty, Chairman, Atomic Energy Commission & Secretary, Department of Atomic Energy, at the 69th General Conference of the IAEA," September 16, 2025, https://barc.gov.in/presentations/69iaea_akm2025.pdf. Accessed on September 18, 2025.

¹¹ "MoP and MoAE Review Roadmap for 100 GW Nuclear Energy Mission," *Power Line*, August 12, 2025, <https://powerline.net.in/2025/08/05/centre-plans-entry-norms-for-private-sector-participation-in-nuclear-power/>. Accessed on September 18, 2025.

¹² Camilla Hodgson, "Uranium Shortfall Threatens Nuclear Energy Renaissance, Industry Warned," *Financial Times*, September 5, 2025, <https://www.ft.com/content/od6cb34e-4fda-4182-a319-11bae1917141>. Accessed on September 18, 2025.

¹³ Moushumi Das Gupta and Soumya Pillai, "Why a US Firm's Thorium Fuel Breakthrough Is Significant for India," *The Print*, August 23, 2025, <https://theprint.in/india/why-a-us-firms-thorium-fuel-breakthrough-is-significant-for-india/2727080/>. Accessed on September 18, 2025.

¹⁴ "IAEA Releases Guide to Stakeholder Engagement," *World Nuclear News*, January 6, 2022, <https://www.world-nuclear-news.org/Articles/IAEA-releases-guide-to-stakeholder-engagement>. Accessed on September 18, 2025.



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