



ICRA

Power Sector

**India's Nuclear Century: Chasing the
100-GW power target by 2047**

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While enactment of the SHANTI Bill 2025 reflects strong policy focus in the nuclear energy sector. Achieving the 100 GW policy target will require timely execution, scaling advanced designs and fuel security, amid challenges like elevated capex costs and long gestation periods.



- **India's stated goal of 100 GW nuclear capacity by 2047 is ambitious and will require accelerated execution.** At present, the installed nuclear power capacity stands at 8.8 GW, accounting for 2% share in the overall installed power generation capacity. With 13.6 GW of nuclear projects under implementation, ICRA expects total nuclear capacity to reach 22.4 GW by 2034.



- **Recent enactment of The SHANTI¹ Act, 2025, is likely to pave the way for the planned expansion of the Indian nuclear power capacity to 100 GW by 2047.** It marks a structural shift from a PSU²-led model to permitting private firms. It also introduces a graded operator liability regime and limits supplier liability, thereby addressing key deterrents for private participation in the sector.



- **While the Act aims to increase the nuclear power capacity to 100 GW by 2047, the implementation of the same comes with some set of challenges** like high capital cost (Rs. 15-20 crore/MW), long gestation periods, stabilisation risks and fuel availability-related challenges. Further, other factors like safety concerns, availability of skilled manpower and lack of nuclear expertise of the private sector power entities remain areas of concern.



- **Tariff for nuclear power projects on cost plus basis is estimated at Rs. 5.9–7.1/kWh**, given the significantly elevated capital cost and thus, remains higher than long term tariff discovery seen for conventional thermal power projects (Rs. 5.5–6.0/kWh) as well as that for RTC³ renewables (Rs. 4.0–5.0/kWh). Nuclear projects, however, offer long-term price stability and baseload reliability.

¹ SHANTI: Sustainable Harnessing and Advancement of Nuclear Energy for Transforming India ; ² PSU – Public Sector Undertaking; ³ RTC: Round the Clock;



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