UPSC & STATE PCS CURRENT AFFAIRS · UJIYARI.COM

DAILY CURRENT AFFAIRS

SHANTI Act and India's 100 GW Nuclear Target by 2047 — Unlocking Private Sector Participation

25 April 2026 · SCIENCE & TECH · ECONOMY · ENVIRONMENT · GS3

CURATED & WRITTEN BY

Bharat Choudhary

UPSC Educator & Content Creator

linkedin.com/in/epicbharat

SHANTI Act and India's 100 GW Nuclear Target by 2047 — Unlocking Private Sector Participation

25 April 2026 · 4 min read · 4 tags

WHY IN NEWS

CEA (Central Electricity Authority) Chairperson Ghanshyam Prasad announced in April 2026 that India targets expanding nuclear power capacity from the current **8.8 GW to 100 GW by 2047** — an **over 11-fold increase**. The legal foundation for this is the **SHANTI Act** (Sustainable Harnessing and Advancement of Nuclear Energy for Transforming India) — passed by Parliament in late 2025 — which replaces the **Atomic Energy Act, 1962** and the **Civil Liability for Nuclear Damage Act (CLNDA), 2010**, and for the first time allows **private Indian companies** to enter the nuclear power sector.

SHANTI ACT — KEY PROVISIONS

Full Name

SHANTI = Sustainable Harnessing and Advancement of Nuclear Energy for Transforming India

What It Replaces

OLD LAW	LIMITATION
Atomic Energy Act, 1962	Nuclear sector entirely state-monopoly; no private entry
Civil Liability for Nuclear Damage Act, 2010	Supplier liability clause (Section 17b) deterred foreign and domestic investment in nuclear equipment supply

Key Changes

FEATURE	SHANTI ACT
Private sector	Indian private companies can build, own, operate, decommission nuclear plants
FDI	NOT permitted — nuclear remains an Indian-controlled sector
Sensitive activities	Uranium enrichment, reprocessing — remain with state entities
Liability	Nuclear damage liability regime reformed (CLNDA replaced)
Regulator	Atomic Energy Regulatory Board (AERB) — independent oversight continues
SMRs	Small Modular Reactors specifically enabled

INDIA'S NUCLEAR POWER — CURRENT STATUS

PARAMETER	DATA
Current capacity	**8.8 GW** (operational)
2047 target	**100 GW**
Operator (currently)	NPCIL (Nuclear Power Corporation of India Ltd) — state monopoly until SHANTI
Reactors	Primarily PHWRs (Pressurised Heavy Water Reactors) + 2 LWRs
Fuel	Uranium (imported + domestic); Thorium (future — Stage 3)
Share of electricity	~3% of India's total generation
Plants	22 operating reactors at 7 sites

THREE-STAGE NUCLEAR PROGRAMME

India has a unique **Three-Stage Nuclear Programme** (designed by Homi J. Bhabha) to eventually use India's vast Thorium reserves:

STAGE	REACTOR TYPE	FUEL	STATUS
Stage 1	PHWR (Pressurised Heavy Water Reactor)	Natural Uranium	Operational (22 reactors)
Stage 2	FBR (Fast Breeder Reactor)	Plutonium + Uranium	Prototype FBR at Kalpakkam (under commissioning)
Stage 3	AHWR (Advanced Heavy Water Reactor)	Thorium + U-233	R&D stage

India's Thorium reserves: ~25% of global reserves (~300,000 tonnes) — world's second largest. This is the long-term rationale for India's unique nuclear doctrine.

BHARAT SMALL REACTORS (BSR) AND SMRS

FEATURE	DETAIL
Bharat Small Reactor	220 MW PHWR-based SMR — designed by NPCIL
Purpose	Easier to site (near demand centres); shorter construction time; lower upfront cost
Private sector RFP	Issued to 'visionary Indian industries' to co-finance and build BSRs
SMR global context	Multiple countries (US, UK, Canada, France) racing to commercialise SMRs
UPSC significance	SMRs = pathway for private nuclear entry without full-scale plant complexity

CHALLENGES AHEAD

CHALLENGE	DETAIL
Fuel security	India is not self-sufficient in uranium; imports from Russia, Kazakhstan, Canada, Australia
Site acquisition	Identifying and acquiring coastal/riverside land for nuclear plants is contentious
Skilled manpower	100 GW by 2047 requires massive scale-up of nuclear engineers, operators
Regulatory capacity	AERB needs strengthening for 10-12 private operators
Public acceptance	Kudankulam protests demonstrated local opposition to nuclear plants
Construction timelines	Nuclear plants historically face cost overruns and delays globally
CLNDA successor	Supplier liability reform must now attract domestic manufacturers of nuclear equipment

UPSC RELEVANCE

Prelims

- SHANTI Act full form: Sustainable Harnessing and Advancement of Nuclear Energy for Transforming India
- Replaces: Atomic Energy Act 1962 + CLNDA 2010
- Key change: Private Indian companies can enter nuclear sector (no FDI)
- India nuclear capacity: 8.8 GW; target: 100 GW by 2047
- CEA Chairman: Ghanshyam Prasad
- Bharat Small Reactor: 220 MW PHWR-type SMR
- NPCIL: Nuclear Power Corporation of India Ltd
- Three-Stage programme: PHWR → FBR → AHWR (Thorium)

Mains

- “SHANTI Act marks a paradigm shift in India’s nuclear governance. Examine the opportunities and risks.” (GS3)
- India’s Three-Stage Nuclear Programme and its strategic rationale (GS3)

FACTS CORNER

FACT	DETAIL
SHANTI Act	Sustainable Harnessing and Advancement of Nuclear Energy for Transforming India
Replaces	Atomic Energy Act 1962 + CLNDA 2010
Private entry	Indian private companies — yes; FDI — no
Sensitive activities	Enrichment, reprocessing — remain state-only
Current nuclear capacity	8.8 GW (22 reactors, 7 sites)
2047 target	100 GW (CEA Chairman Ghanshyam Prasad)
Bharat Small Reactor	220 MW; PHWR-type; NPCIL design
Stage 1	PHWR + natural uranium — operational
Stage 2	FBR + plutonium — Kalpakkam prototype under commissioning
Stage 3	Thorium + U-233 — R&D stage
India thorium reserves	~25% of global reserves; 2nd largest in world

← NEWER ARTICLE
India's Landfills Among World's Top Methane Emitters —...

OLDER ARTICLE →
Thrissur Pooram Fireworks Tragedy — 15 Dead at Mundathikode...

RELATED EDITORIALS

INDIAN EXPRESS

Burning Rubbish, Leaking Climate — India's Landfill Methane Crisis and the Waste Governance Vacuum

25 Apr

INDIAN EXPRESS

Decriminalising the State — Jan Vishwas Act 2026 and the Long Road to Trust-Based Governance

25 Apr

INDIAN EXPRESS

Levelling Up — OGAI and the Challenge of Governing India's Online Gaming Ecosystem

25 Apr

THE HINDU

Nuclear at a Crossroads — SHANTI Act, Private Entry, and India's 100 GW Ambition

25 Apr

RELATED KEY TERMS

KEY TERM

ACNAS

Advisory Committee on National Accounts Statistics — the expert body...

KEY TERM

Act East Policy

India's strategic foreign policy framework prioritising active...

KEY TERM

Active Case Finding (TB)

A proactive public health strategy where health workers systematically...

KEY TERM

Advanced Technology Vessel (ATV) Programme

India's classified, decades-long programme to indigenously design and...

CURATED & WRITTEN BY

Bharat Choudhary

UPSC Educator & Content Creator

linkedin.com/in/epicbharat

📖 Read Full Article on Ujiyari →

https://ujiyari.com/daily/2026/04/25/shanti-act-india-nuclear-power-100gw-2047/