Chintan Research Foundation

Manthan
Ideas and implementation through Science, Technologies, and Innovations

Finovista

POLICY DIALOGUE

SMRs FOR DEFENCE MANUFACTURING AND DATA CENTRE OPERATION

02 June 2026 | Juniper Hall, India Habitat Centre

BACKGROUND NOTE

India's journey towards becoming a Viksit Bharat by 2047 and achieving Net Zero by 2070 places the transformation of its power sector at the centre of national strategy. The twin objective of sustaining high economic growth and ensuring long-term decarbonisation require a power system that is not only clean, but also reliable, resilient, sustainable and strategically secure. The NITI Aayog report, Scenarios Towards Viksit Bharat and Net Zero underscores the need for a diversified electricity mix combining renewables, grid modernisation, energy storage, and clean firm power. In this architecture, nuclear energy, including advanced reactors and Small Modular Reactors (SMRs), is recognised as a critical low-carbon baseload source capable of complementing variable renewable energy while supporting industrial expansion and strategic infrastructure. Nuclear power's ability to deliver continuous, high-quality electricity reduces fossil fuel dependence and strengthens energy sovereignty, particularly for mission-critical sectors.

Aligned with this national vision, the Government of India's Sustainable Harnessing and Advancement of Nuclear Energy for Transforming India (SHANTI) Act , 2025, seeks to modernise and consolidate India's nuclear legal framework. The legislation aims to streamline licensing, enhance regulatory oversight, clarify liability provisions, and enable calibrated private sector participation to accelerate nuclear expansion. It also supports the development and deployment of indigenous SMRs, with operational targets envisioned by 2033 and a broader ambition of achieving 100 GW of nuclear capacity by 2047, as announced under the Nuclear Energy Mission through the Union Budget 2025-26. The Department of Atomic Energy (DAE) has already undertaken design and development work on indigenous SMRs, namely the 220 MWe Bharat Small Modular Reactor (BSMR-200), the 55 MWe Small Modular Reactor (SMR-55), and the up to 5 MWth High-temperature gas-cooled reactor meant for hydrogen generation.

Additionally, India's 500 MWe Prototype Fast Breeder Reactor (PFBR), achieved its first criticality in 2026, marking a significant milestone in the nation's three-stage nuclear program, as conceived by Dr. Homi J. Bhabha.

At the same time, Indigenous defence manufacturing and data centres have emerged as twin strategic priorities because they simultaneously underpin military self-reliance, digital sovereignty and high-value economic growth, while creating large, geographically concentrated loads that require round-the-clock, high-quality power. India's defence production has already reached about ₹1.27 lakh crore in 2023 —24, a 174% increase over 2014 15—on the back of Make in India, with exports crossing ₹21,000 crore and a target of ₹3 lakh crore in output and ₹50,000 crore in exports by 2029. In parallel, India's total data centre capacity has increased from about 375 MW in 2020 to around 1500 MW by 2025. To accelerate this growth, the Centre and leading states have notified dedicated data centre policies that accord infrastructure status, single window clearances, concessional land, power tariff subsidies and fiscal incentives. These defence and digital clusters—often co located in industrial corridors around major metros and coastal hubs—share three characteristics that make them natural candidates for nuclear power solutions: they are mission critical (even short outages carry unacceptable security and economic costs), power dense (hundreds of MW per campus) and increasingly under pressure to decarbonise, with electricity constituting the largest share of lifecycle emissions and operating costs. For instance, the expected electricity demand from the growth of AI and other large-scale data centres is estimated to reach 13.56 GW by 2031–32. Therefore, SMRs, with their modular construction, smaller unit sizes (tens to a few hundreds of MWe) and enhanced safety features, can be deployed as on-site or near-site captive plants, providing islandable, low-carbon baseload to defence industrial corridors and data centre hubs. Additionally, such concentrated, clustered demand in these corridors and hubs can serve as ready-to-serve demand for SMR deployment, reducing its costs through economies of scale and, consequently, scaling its production.

Against this backdrop of policy momentum and structural reform, Chintan Research Foundation (CRF) and Finovista propose to convene a high-level Roundtable on Small Modular Reactors (SMRs) for Defence Manufacturing and Data Centre Operation. The discussions will examine SMRs not only as next-generation low-carbon energy systems but also in terms of technological maturity, reactor typologies, regulatory readiness, global feasibility, innovation trends, and their applicability within India's strategic infrastructure landscape, alongside international best practices in deployment, safety, and financing. Particular attention will be given to how modular fabrication, hybrid integration with renewables and advanced fuel cycles can be aligned with India's defence industrial corridors and rapidly expanding hyperscale data centre ecosystem.

Importantly, both defence manufacturing units and advanced data centre operators in India will require highly skilled technical teams and sophisticated operational capabilities, and a stable electricity supply. Their operational models, capital structures, and relatively higher value-addition margins provide the capacity to accommodate initial technology absorption costs during early deployment phases, and therefore, SMR can fit their purpose. As the Government of India continues to strongly promote defence indigenisation and digital infrastructure expansion, SMRs present a strategic opportunity to provide secure, uninterrupted, and clean power tailored to these priority sectors.

By linking India's net-zero pathway, regulatory reforms under the SHANTI Bill, and the operational requirements of defence and digital infrastructure, this discussion aims to identify pilot deployment pathways, outline partnership frameworks, and develop actionable policy insights that position SMRs as a cornerstone of India's strategic energy resilience.

OBJECTIVES OF THE ROUNDTABLE

- Examine the role of advanced nuclear technologies, including SMRs and fast reactors, in delivering clean, reliable and secure baseload power for mission-critical applications.
- Assess pathways for integrating nuclear energy systems with the broader power mix, including renewables, storage and grid modernisation.
- Position Small Modular Reactors (SMRs) and fast reactor technologies within India's evolving energy–technology architecture, particularly in the context of strategic & digital infrastructure, and evaluate their suitability for distributed, cluster-based infrastructure, including defence corridors and data centre hubs.
- Deliberate on the sustainability and resource implications of next-generation infrastructure growth including energy demand, water use, land footprint and climate resilience.
- Examine regulatory, financial, and institutional enablers, including the implications of the SHANTI Act, licensing and regulatory frameworks, liability provisions and pathways for calibrated private sector participation and identify actionable pathways for pilot deployments and scalable implementation, including partnerships, financing models, and phased adoption strategies.

The objective is not to reach immediate consensus, but to clarify trade-offs, align advanced nuclear technologies, including SMRs and fast reactors, with policy and market frameworks, and identify actionable pathways that balance growth, sustainability, energy security, and strategic resilience in India's transition toward Viksit Bharat and Net Zero.

PROGRAMME

Schedule	Particulars
1300 – 1400	Registration and Lunch
1400 – 1505	Inaugural Session • Welcome Address • Opening Address • Context Setting Presentation • Special Address
1505 – 1605	Moderated Panel Discussion
1605 – 1630	Audience Engagement
1630 – 1645	Closing Remarks
1645h onwards	Tea & Networking

ABOUT CRF

Chintan Research Foundation (CRF) is an emerging independent think tank dedicated to shaping policy through rigorous research and thought leadership. With a strong focus on fostering collaboration between policymakers and industry, CRF integrates practical insights into its research and advocacy efforts. It conducts comprehensive research to support informed decision-making and engages with stakeholders through discussions, events, and publications. CRF's research is focused on three core areas – Climate Change & Energy Transition, Economy & Trade, and Geopolitics & Strategic Studies. The Centre for Climate Change & Energy Transition aims to be a research and expertise hub, focusing on sustainable and clean energy, environmental stewardship, and climate actions.

For further information about CRF, please visit: crfindia.org

ABOUT MANTHAN

Manthan is an initiative led by the **Office of Principal Scientific Adviser (PSA)** with the potential to change the landscape of science- and technology-based social-impact innovation and solutions in India. The aim of the platform is to empower various stakeholders to scale up the interactions with researchers/ innovators and facilitate R&D/ innovation, share challenges focused on emerging technologies, other scientific interventions, as well as those with a social impact. It also provides an overview of the social impact of science, and technology-based solutions. The platform is built on four pillars - Opportunity Creation, Proposals for collaboration,Innovation exhibition, Conference Facilitation.

For further information about CRF, please visit: manthan.gov.in

ABOUT FINOVISTA

Finovista is a New Delhi-based Program Management Agency specializing in the conceptualization, design, development, and implementation of impactful capacity-building and development programs. With extensive experience in managing multi-stakeholder initiatives, Finovista works closely with governments, international organizations, development agencies, academia, and corporates in India and globally to address complex development challenges through innovative and sustainable interventions. The organization focuses on a wide range of programs, including Entrepreneurship Development Programs, Innovation Challenges, Investor Pitching & Connect initiatives, and specialized training programs. As a sector-agnostic consulting firm, Finovista works across diverse domains such as Clean Cooking, Energy, Environment, Low Carbon Growth Technologies, Clean Energy, Green Finance, Result-Based Finance, Carbon Finance, and Social Enterprise Development.

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