

# INDIA-RUSSIA ON NUCLEAR ENERGY: INTERNATIONAL RELATION

**NEWS:** India & Russia eye collaboration on nuclear energy, cybersecurity

## WHAT'S IN THE NEWS?

India and Russia are expanding cooperation into nuclear energy (via thorium-based SMRs), cybersecurity, and advanced technologies, moving beyond traditional defence ties. This strategic alignment aims to boost energy security, digital sovereignty, and technological resilience amid global geopolitical shifts.

### Context: Deepening India–Russia Strategic Cooperation

- India and Russia are **broadening their partnership** into **nuclear energy, cybersecurity, and advanced technologies**.
- These developments reflect both **geopolitical shifts** and **domestic policy adaptations** to foster strategic autonomy and technological growth.

## 1. Developments in Indo-Russian Cooperation

### A. Nuclear Energy Expansion

- India is considering **amendments to its nuclear liability laws** to attract **greater foreign investment** and enhance collaboration in nuclear energy.
- **Rosatom**, the Russian state-owned nuclear corporation (which is building the **Kudankulam Nuclear Power Plant** in Tamil Nadu), has signed an **MoU with Maharashtra**.
- The agreement focuses on **thorium-based Small Modular Reactors (SMRs)**, which promise a safer, scalable nuclear energy solution.

### What are Small Modular Reactors (SMRs)?

- **SMRs** are **advanced nuclear reactors** with a capacity of up to **300 MW(e)**, about one-third the size of traditional nuclear plants.
- Key features:
  - **Small:** Compact physical size.
  - **Modular:** Factory-assembled and transportable units.
  - **Reactor:** Uses **nuclear fission** to produce thermal energy.
- **Four main types of SMRs:**
  - **Light Water Reactors**
  - **High Temperature Gas Reactors**
  - **Liquid Metal Reactors**

- **Molten Salt Reactors**

## **B. Cybersecurity and Digital Infrastructure**

- India and Russia are exploring **joint development** of:
  - **Cyber defence tools**
  - **Sector-specific firewalls**
  - **Security software for global markets**
- **Cyberus Foundation**, a Russian think tank, sees India's progress in **fintech, smart cities, and e-governance** as key for mutual collaboration.

## **C. Science and Technology Cooperation**

- **Innopraktika**, a Moscow-based NGO, will help establish an **Indo-Russian Technology Association and Engineering Centre** with offices in both countries.
- India's **University of Delhi** and Russia's **Higher School of Economics** have signed an MoU to establish a "**mirror laboratory**" focused on:
  - Data storage and processing
  - Aerospace and space systems research

## **D. Emerging Domains for Collaboration**

- Key high-tech areas identified include:
  - **Semiconductors**
  - **Artificial Intelligence (AI)**
  - **Space technology**
  - **Critical minerals**
  - **Co-development models** similar to **BrahMos**, aimed at **joint innovation** and product development.

## **2. Strategic Significance of the Partnership**

### **A. Energy Security**

- **SMRs** can contribute to India's **low-carbon energy transition** by offering **safe, flexible, and decentralized nuclear energy**.

### **B. Technological Sovereignty**

- Collaborations in **AI, cyber defence, and semiconductors** will reduce India's reliance on **Western technologies**, enhancing **strategic autonomy**.

### C. Geopolitical Realignment

- Closer ties with Russia provide India with **strategic leverage** amid:
  - **Tensions in Asia-Pacific**
  - **Fragmentation of multilateral frameworks**

### D. Economic Diversification

- In **November 2024**, India inaugurated a **Russian Business Center in New Delhi** to promote:
  - **High-tech investment**
  - **Bilateral trade**
  - **Technology exchange**

### 3. Concluding Remarks

- The **India-Russia partnership** is evolving from traditional **defence cooperation** to include **cutting-edge technological and energy domains**.
- With **enabling policy reforms** and **structured cooperation frameworks**, this collaboration has the potential to:
  - Strengthen **strategic autonomy**
  - Contribute to a **multipolar, innovation-led global order**
  - Enhance India's **energy security and digital resilience** in a shifting geopolitical environment.

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