Bihar's First Nuclear Power Plant

Why in News?

Bihar will be among the **first six states in India** to receive its first atomic power plant under the country's new **Nuclear Energy Mission.**

Key Points

About First Nuclear Power Plant

- **Announcement and Approval:** During the **5th Eastern Region Power Ministers' meeting in Patna**, the Union Power Minister announced the Centre's approval for Bihar to set up a **nuclear power plant** based on **Small Modular Reactor (SMR) technology.**
  - The meeting, attended by representatives from Bihar, West Bengal, Odisha, Jharkhand, and the Andaman & Nicobar Islands, marked a key step towards **advancing nuclear energy in the eastern region.**
- **Significance for Bihar: The project is expected to ensure a stable electricity supply, attract industrial investment, generate employment, and drive technological advancement in the state.**
  - Given Bihar's historical challenges with power deficits and limited infrastructure, the initiative marks a transformative shift in its energy landscape.

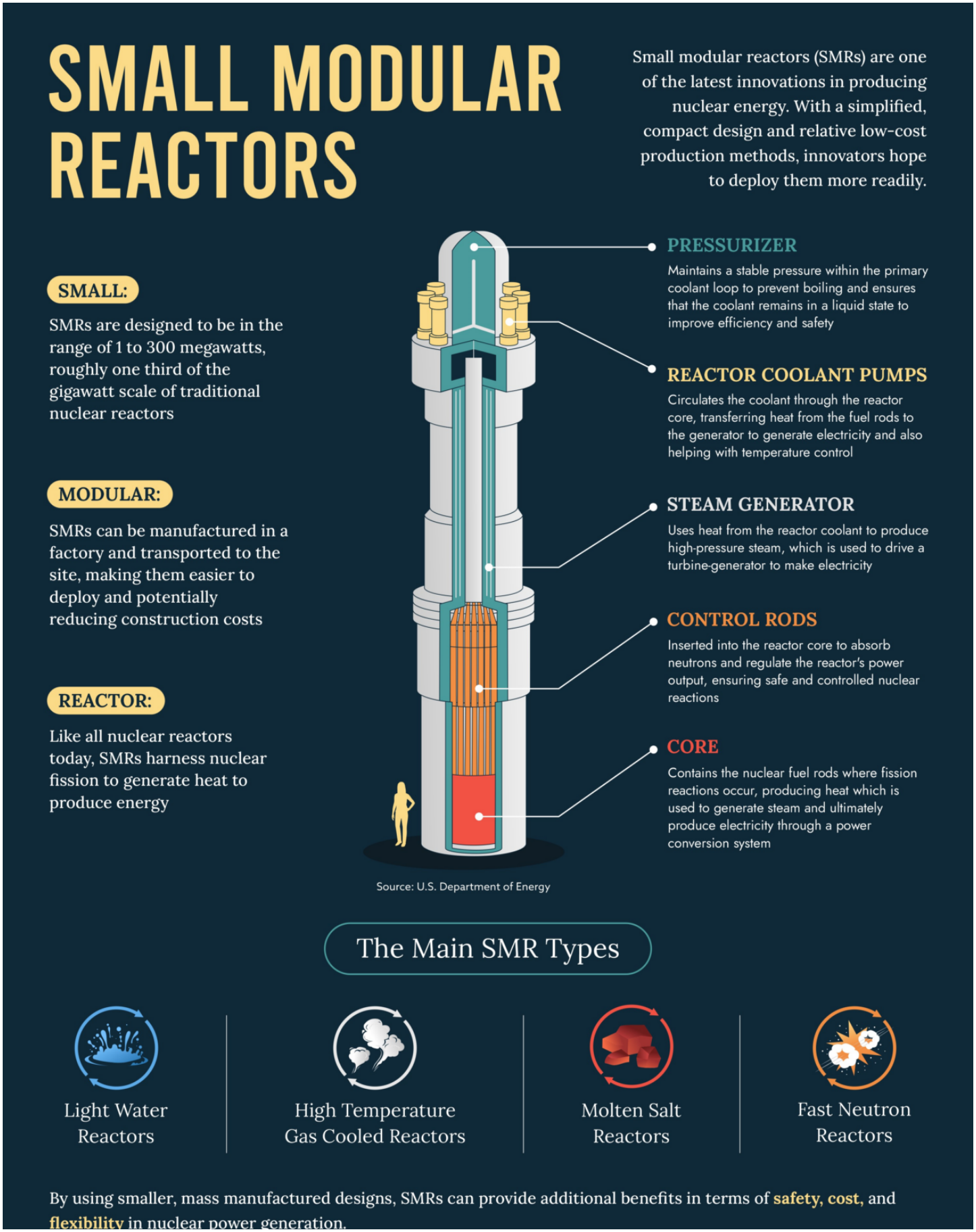
Nuclear Energy Mission

- **Ambitious Capacity Expansion:** It aims to increase India's nuclear power capacity from the **current 8,180 MW** (as of January 30, 2025) to **100 GW by 2047,** positioning nuclear energy as a **major pillar in India's energy** mix and supporting long-term energy security and sustainability.
- **Focus on Indigenous Technology: The mission prioritizes the research and development of indigenous technologies, especially Small Modular Reactors (SMRs), with an allocation of ₹20,000 crore.**
  - The goal is to develop and operationalize at least five indigenously designed SMRs by 2033, leveraging India's expertise in Pressurized Heavy Water Reactors (PHWRs).
  - It also seeks to **set up one nuclear power plant in each state** to enhance India's energy security.
- **Private Sector Participation:** Legislative changes are planned to amend the **Atomic Energy Act, 1962**, and the **Civil Liability for Nuclear Damage Act, 2010,** to encourage private sector investment and collaboration.
  - This will facilitate **faster deployment of nuclear projects**, innovation, and economic growth, with private entities contributing land, capital, and funding, while **NPCIL** manages reactor operations.

Small Modular Reactors (SMRs)

- SMRs are **advanced nuclear reactors** with a capacity of **up to 300 MW(e)**, about one-third of traditional reactors.

- SMRs represent an **advanced, cost-effective, and safer nuclear technology** suitable for regions with moderate power demands, especially where **large-scale plants are not feasible.**
- **Bhabha Atomic Research Centre (BARC)** is working on SMRs for repurposing retiring coal-based power plants and meeting the energy needs of remote areas.
    - The **Department of Atomic Energy (DAE)** is also focusing on developing reactors such as **high-temperature gas-cooled reactors** for hydrogen generation and molten salt reactors to utilize India's vast thorium resources.



Other Recent Developments in Power Sector

- **Battery Energy Storage Projects: In addition to the nuclear plant, the Central**

Government has approved a 1,000 MW battery storage capacity project in Bihar.
    - This project will support renewable energy integration and enhance grid stability, with viability gap funding of ₹18 lakh per megawatt.
    - The Prime Minister had also laid the foundation stone for a 500 MWh Battery Energy Storage System (BESS) project in Siwan on 20th June 2025.
- **Additional Support to Bihar:** To support peak summer demand, the Centre has also agreed to supply an additional 500 MW of electricity to Bihar for the next three to six months.
    - The state was also commended for installing eight million smart meters and achieving a substantial reduction in technical and commercial losses, indicating significant progress in the power sector.