

## **India Nuclear Power Plant Equipment - Market Share Analysis, Industry Trends & Statistics, Growth Forecasts (2025 - 2030)**

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### **Report description:**

The India Nuclear Power Plant Equipment Market is expected to register a CAGR of greater than 4% during the forecast period.

COVID-19 negatively impacted the market in 2020. Presently the market is likely to reach pre-pandemic levels.

#### Key Highlights

- Over the medium term, the significant contribution of nuclear energy in reducing GHG emissions while fulfilling the increasing energy demands of a growing population and supporting sustainable development is driving the market.
- On the other hand, rising investments in alternative clean energy sources such as solar and wind are expected to restrain the market's growth during the forecast period.
- Nevertheless, the research and development into commercializing new nuclear reactor designs, such as Fast Breeder Reactor, is expected to be a significant opportunity for the market beyond the forecast period.

#### India Nuclear Power Plant Equipment Market Trends

##### Pressurized Heavy Water Reactors to Dominate the Market

- PHWRs generally use unenriched natural uranium oxide as fuel and, therefore, need more efficient heavy water as the coolant. The heavy water enhances the neutron economy and allows the reactor to operate without fuel enrichment facilities, enabling the reactor to use alternate fuel cycles.

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- The PHWR design requires thin-walled pressure tubes, unlike PWR nuclear plants. This allows the distribution of pressure boundaries in many small-diameter pressure tubes. As a result, this design has a lesser chance of accidental rupture of a pressure boundary compared to PWR designs. Therefore, PHWR is considered safer than PWR plants.
- India is the second-largest market for PHWR technology globally, trailing behind only Canada, and as of February 2021, India operates 18 PHWR units with a total capacity of 5080 MW, of which consists of 15 of 220 MW, two units of 540 MWe, and 1 unit of 700 MWe.
- In January 2021, Kakrapar-3, the first indigenously developed IPHWR-700 reactor model, was synchronized with the grid for the first time. As of May 2022, 5 indigenously-designed PHWR units, each of 700 MWe, are in various stages of construction.
- Additionally, ten other PHWR reactors are planned in the country. Globally, there are four under-construction PHWRs. All these PHWRs are being constructed by the National Power Corporation of India, with 2 in Kakrapar and 2 in Rajasthan. The estimated capacity of these reactors will be around 2.8 GWe.
- Thus, such developments in the country are expected to support the India nuclear power plant equipment market during the forecast period.

#### Island Equipment to Dominate the Market

- The major equipment under the island equipment category is the nuclear steam supply system (NSSS) and safety system. The nuclear steam supply system includes reactors that contain the reactor core, control system, reactor coolant pumps (RCP), primary piping, pressurizer for controlling the pressure of primary coolant (only used in PWR). It also consists of steam generators for heat exchange between the primary circuit and the secondary circuit.
- As per Central Electricity Authority statistics, by March 2022, India's nuclear energy installed capacity accounts for about 6,780 MW. Nuclear energy is one of the significant energy sources in India's electricity mix.
- India had nearly 6.8 GW of installed nuclear capacity as of 2021, and as of December 2022, around 8.7 GW net capacity under construction and over 80 GW planned or proposed. Despite the fact that nuclear energy makes up a small share of the country's installed capacity mix, with rising demand for clean energy, the government is expected to invest significantly in the development of new nuclear power plant facilities. With upcoming projects, the demand for island equipment is likely to grow significantly.
- Those nuclear projects already under construction are expected to come online over the next ten years, albeit delayed. The government plans to source 25% of the country's electricity from nuclear energy by 2050, up from the current level of 2.5% - and the project pipeline strengthened in line with these targets, driving the market considerably in the forecast period.
- In March 2022, the Indian government announced that it planned to start the construction of PHWRs in fleet mode from 2023. The first concrete for Kaiga units 5 and 6 is expected in 2023, followed by Gorakhpur Haryana Anu Vidyut Praiyonjan units 3 and 4 and Mahi Banswara Rajasthan Atomic Power Projects units 1-4 in 2024 and Chutka Madhya Pradesh units 1 and 2 in 2025
- In September 2021, BHEL received orders worth INR 108 billion for turbine islands for six nuclear power pressurized heavy water reactor (PHWR) units, 4 at Gorakhpur and 2 at Kaiga, which is the largest order in BHEL's history.
- Additionally, in July 2021, Bharat Heavy Electricals Ltd (BHEL) received an INR 14 billion contract to supply twelve 700MWe Indian-designed PHWR steam generators to be built at four sites including Gorakhpur and Kaiga. Such large investments in PHWR reactors by India is expected to push the demand for PHWR power plant equipment during the forecast period.
- Therefore considering the above-mentioned points, island equipment is likely to dominate the market during the forecast period.

#### India Nuclear Power Plant Equipment Industry Overview

The India nuclear power plant equipment market is moderately consolidated in nature. Some of the major players in the market (in no particular order) include Larsen & Toubro Ltd, Rosatom State Atomic Energy Corporation, Hindustan Construction Company, Bharat Heavy Electricals Limited, and Mitsubishi Heavy Industries.

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#### Additional Benefits:

- The market estimate (ME) sheet in Excel format
- 3 months of analyst support

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