Nuclear Power Plant and Equipment Market Outlook - Forecast Trends, Market Size, Share and Growth Analysis Report (2025-2034)

Market Report | 2025-07-14 | 174 pages | EMR Inc.

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Report description:

The global nuclear power plant and equipment market attained a value of USD 40.63 Billion in 2024. The market is estimated to grow at a CAGR of 6.84% during 2025-2034 to reach a value of USD 78.74 Billion by 2034.

Global Nuclear Power Plant and Equipment Market Growth

The nuclear power plant and equipment market is driven by the growing demand for electricity from low-carbon sources and the growth in the construction of nuclear reactors.

As of July 2023, nuclear power accounted for about 10% of the electricity production globally, primarily led by advanced economies. By 2024, the global electricity demand is projected to increase by around 4%, up from 2.3% in 2023, leading to further opportunities for electricity production from nuclear sources.

Figure: Domestic Electricity Consumption (TWh) by Country; 2023

Between 2020 and 2035, China aims to construct 150 new nuclear reactors. According to the International Atomic Energy Agency (IAEA), as of September 2024, around 54 pressurized light-water moderated and cooled reactor have been installed globally. As of 2024, China and India hold the most number of reactors under construction globally, accounting for 28 and 7 units, respectively.

Figure: Operational Reactors and Their Net Electric Capacity (GW) by Type; 2024

Global electricity consumption increased by 2.6% in 2023, aligning with the typical annual growth rate of about 2.7%. China's

consumption grew by more than 6.9%, representing one-third of global usage, while India saw a 6.7% rise and Brazil 3.2%, driven by strong economic growth and higher demand in sectors like cooling in India and Brazil, and irrigation in India.

Key Trends and Developments

Presence of favourable government policies; adoption of new technologies; nuclear power modernisation attempts; and increasing demand for electricity are the key trends impacting the nuclear power plant and equipment market demand

Sep 9, 2024

GE Hitachi Nuclear Energy (GEH), a part of GE Vernova's nuclear division, signed multiple Memoranda of Understanding (MoUs) with Aecon, AtkinsRealis, Jacobs, and Laing O'Rourke. These agreements advanced GEH's efforts to potentially deploy its BWRX-300 small modular reactor technology in the UK. The MoUs aligned with GEH's participation in the ongoing small modular reactor selection process led by Great British Nuclear (GBN).

Feb 14, 2024

Global Nuclear Fuel (GNF), part of GE Vernova's Nuclear Fuel business, received approval from the U.S. Nuclear Regulatory Commission (NRC) to manufacture, ship, and assess the performance of nuclear fuel containing Uranium-235 with enrichments up to 8 weight percent. This approval marked a significant step for GNF in advancing its fuel capabilities.

Jan 30, 2024

SaskPower and GE Hitachi (GEH) signed an agreement to advance small modular reactor (SMR) development in Saskatchewan. The deal facilitates collaboration on project planning and the exchange of expertise concerning the design, fuel sourcing, and production for the BWRX-300 reactor.

Jul 7, 2023

The Province of Ontario, in partnership with Ontario Power Generation (OPG), revealed it had initiated planning and licensing for the installation of three additional GE Hitachi Nuclear Energy (GEH) BWRX-300 small modular reactors at the Darlington New Nuclear Project site. This decision expanded the total number of planned BWRX-300 SMRs at the site, located east of Toronto, to four.

Favourable government policies aid the nuclear power plant and equipment market

Being a low-carbon source, governments globally are focusing on nuclear power to achieve their decarbonisation goals. For instance, the Inflation Reduction Act signed into law in August 2022 in the USA supports existing and new nuclear development through investment and tax incentives for large existing nuclear plants and newer advanced reactors.

Advancement in nuclear power equipment drives the growth of the market

Innovation in advanced reactor designs offers enhanced safety features. Small modular reactors, fast reactors, and thorium reactors increase flexibility in capacity and integrate energy systems by enabling novel fuel cycle solutions.

Nuclear plant modernization plans necessitate the adoption of new equipment

The upgrades in nuclear plant projects drive the demand for new equipment. As of July 2024, about 60 reactors are under construction, and 110 reactors are planned for modernization globally, in which most construction is planned in Asia.

Nuclear power is a significant source of electricity globally

As of July 2023, it accounted for approximately 10% of global electricity production. Nuclear power supplies electricity to 28 U.S. states and supports various non-electric applications, including medical and space exploration. In 2022, nuclear power contributed 22% to the EU's electricity generation.

Global Nuclear Power Plant and Equipment Market Trends

Increasing energy demands create opportunities for nuclear power to play a larger role in diversifying energy sources. The U.S. Department of Energy (DOE) projects an additional 200 GW of nuclear capacity to reach net-zero emissions by 2050. Some of the nuclear power can be potentially produced at or near retiring coal plants. As of 2024, around 30% of the USA's coal-fired power plants are projected to retire by 2035. According to the DOE, over 300 existing and retired coal power plant sites are suitable to host advanced nuclear power plants in the USA.

SMRs have a power capacity of up to 300 MW(e) per unit, which is about 1/3rd of the generating capacity of traditional nuclear power reactors. SMRs are advantageous due to their small and modular design. Prefabricated units reduce construction costs and delays compared to custom-designed reactors. Limited grid coverage and high connection costs hinder rural electrification. SMRs can address this by being installed on existing grids or off-grid, offering low-carbon power in areas with inadequate transmission infrastructure. SMRs have reduced fuel needs, requiring refueling every 3 to 7 years, compared to 1 to 2 years for conventional plants. SMrs are under construction or in the licensing stage in China, Russia, Argentina, Canada, South Korea, and the USA.

Global Nuclear Power Plant and Equipment Industry Segmentation

"Global Nuclear Power Plant and Equipment Market Report and Forecast 2025-2034" offers a detailed analysis of the market based on the following segments:

Market Breakup by Reactor Type

- Pressurised Water Reactor (PWR)
- Pressurised Heavy Water Reactor (PHWR)
- Boiling Water Reactor (BWR)
- Light Water Graphite Reactor (LWGR)
- Others

Market Breakup by Equipment Type

- Island Equipment
- Auxiliary Equipment

Market Breakup by Application

- Military
- Public Utilities
- Others

Market Breakup by Region

- North America
- Europe
- Asia Pacific
- Latin America
- Middle East and Africa

Global Nuclear Power Plant and Equipment Market Share

Based on application, public utilities account for a significant share of the nuclear power plant and equipment market

Nuclear power is being increasingly used to generate electricity, amidst the growing importance of net zero emissions. In 2022, the nuclear reactors in the United States contributed to 18% of total electrical output, whereas in the UK, the nuclear power provided 13.9% of total electricity supplied in 2022. In 2023, nuclear reactors generated a total of 2,602 TWh of electricity, an increase from 2,544 TWh in 2022.

Governments such as Russia and China are developing microreactors for propulsion. By 2030, the US army aims to deploy prototype microreactor nuclear power plant at an installation in the continental U.S. Nuclear power is being used for powerful submarine propulsion. As of February 2023, globally, over 160 ships were powered by over 200 small nuclear reactors.

Based on reactor type, pressurised water reactor is a major contributor to the global nuclear power plant and equipment market revenue

A pressurised water reactor (PWR) has fuel assemblies of 200-300 rods each, which are arranged vertically in the core. Typically, a large reactor has the presence of about 150-250 fuel assemblies with 80-100 tonnes of uranium. The nuclear island equipment includes a reactor pressure vessel, steam generator, and pressurizer. As of April 2022, the total number of Pressurized Light-Water Moderated and Cooled Reactors across the globe were recorded at 306.

The Pressurised Heavy Water Reactors (PHWRs) are typically fuelled by natural uranium. Typically, for a 700 MW PHWR (at 85% Capacity Factor), the annual requirement of fuel (UO2) is about 125 tons.

Leading Manufacturers in the Global Nuclear Power Plant and Equipment Market

The market players are focusing on providing equipment with advanced features and technologies.

BWX Technologies, Inc.

BWXT provides precision-manufactured components, services, and fuel to the commercial nuclear power industry, serving clients across four continents. The company has a workforce of more than 7,000 employees and operates 14 key sites in the U.S., Canada, and the U.K., highlighting its extensive global presence.

The State Atomic Energy Corporation Rosatom (ROSATOM)

ROSATOM is a diversified global leader in the nuclear energy industry, based in Russia. The company owns assets and possesses comprehensive competencies across all stages of the nuclear production chain. As a global leader in nuclear power plant

construction, the company manages 39 power units in 10 countries.

Dongfang Electric Co., Ltd.

Dongfang Electric plays a major role in the electric power industry, supplying around one-third of China's energy equipment. As of 2024, DEC holds over 50% of the market share for conventional island equipment and 30% for nuclear island equipment in China's domestic market.

Nuscale Power Corp.

Founded in 2007, NuScale Power Corp. specializes in the development of small modular reactors (SMRs), focusing on scalable nuclear energy solutions. The company has a global reach, with its small modular reactor technology attracting interest from countries across North America, Europe, Asia, and the Middle East.

Other notable players operating in the global nuclear power plant and equipment market are GE Vernova Inc, Korea Electric Power Corporation, Toshiba Energy Systems & Solutions Corporation, Mitsubishi Heavy Industries, Ltd, Larsen & Toubro Limited, and Doosan Enerbility Co., Ltd, among others.

Global Nuclear Power Plant and Equipment Market Analysis by Region

Asia is expected to dominate the nuclear capacity installations by 2033 installing over 49 GW, as China, India, and Japan make huge investments towards clean energy solutions. As of August 2024, Asia has 145 operational nuclear power reactors and 45 under construction.

EU regulators are increasingly advocating nuclear power as a key solution for reducing greenhouse gas emissions and achieving carbon neutrality in Europe by 2050. In 2022, nuclear power accounted for 22% of the EU's energy mix.

Opportunities for nuclear energy in North America include its ability to provide a reliable power source and its low emissions profile compared to fossil fuels. As of 2023, nuclear energy meets 20% of the electricity demand in the United States and 15% in Canada.

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