Nuclear Power Market - Growth, Trends, and Forecasts (2023 - 2028)

Market Report | 2023-01-23 | 120 pages | Mordor Intelligence

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Report description:

The global nuclear power market is projected to register a CAGR of over 1.5% during the forecast period.

COVID-19 negatively impacted the market in 2020. Presently the market has reached pre-pandemic levels.

Key Highlights
Factors such as the ability of nuclear energy to generate electricity with lower carbon emissions compared to fossil fuels have been driving the market's growth over the medium term.
On the other hand, the high initial cost of setting up a nuclear power plant and the availability of alternative power generation sources, such as renewable energy, is likely to restrain the market's growth during the forecast period.
Nevertheless, nations worldwide are researching and developing generation IV nuclear energy technologies to promote safety, technical, economic, and environmental advancements in nuclear energy. This, in turn, is likely to create several future opportunities for the market.
Asia-Pacific is expected to witness significant growth in the nuclear power market during the forecast period, owing to its substantial share of nuclear energy in China and India.

Nuclear Power Market Trends

Energy Segment Expected to Dominate the Market

Nuclear energy is released from the nucleus or the core of an atom of protons and neutrons. Nuclear energy can be produced either in nuclear fission (when the nuclei of atoms split into several parts) or by fusion (when nuclei fuse). In today's world, nuclear fission produces electricity, while nuclear fusion technology produces power in the research & development (R&D) phase.? As of

2021, the global nuclear power generation was about 2,653 TWh compared to around 2,553 TWh in 2020.
The growing population and the economy, coupled with rapid urbanization globally, are expected to increase energy demand significantly in the coming years. The global primary energy demand in 2020 reached more than 556 exajoules, witnessing a 10% increase compared to about 505 exajoules in 2010. According to the International Energy Agency (IEA), global energy needs are expected to rise by 26% by 2050. The global electricity demand is likely to double due to emerging and developing economies.?
As of October 2022, about 437 commercial nuclear power plants were operating across 32 countries. The United States has the highest nuclear electricity generation capacity. France has the second-highest nuclear electricity generation capacity.?
Several countries have plans to invest in nuclear power plants over the coming years. For instance, in November 2021, China announced that it plans to build at least 150 new reactors in the next 15 years, which is more than the number made by the rest of the world in the last 35 years. The country's move also comes amid power shortages and blackouts, which have resulted in Beijing's unprecedented decision. The cost of the new nuclear ambition of China has been estimated to be around USD 440 billion. The China General Nuclear Power Corporation announced that it was looking to expand its nuclear capacity significantly by 2035.
The Indian government is also committed to expand its nuclear power capacity as part of its massive infrastructure development program. In December 2021, India's Department of Atomic Energy announced plans to expand the current nuclear power capacity of 6.78 GW to about 22.480 GW by 2031. Additionally, the net-zero targets in India are likely to be met through a combination of various clean energy sources, including nuclear power, over the coming years.?
In February 2022, France announced plans to develop six new nuclear power reactors, building a further eight, and push ahead with the development of small modular reactors to reduce the country's energy demand while increasing its carbon-free energy capacity. Moreover, several other nuclear power plants are in the construction or planning phase globally. Such significant nuclear plans and investment scenarios are likely to result in substantial development of the nuclear power market over the coming years.?
Therefore, the energy segment is expected to dominate the nuclear power market during the forecast period due to the abovementioned points.

Asia-Pacific Expected to Witness Significant Growth

In contrast to North America and Europe, where growth in nuclear electricity generating capacity has been limited for many years, several countries in the Asia-Pacific are planning and building new nuclear power plants to meet their increasing demand for clean electricity.?
As of 2021, China had the most extensive new-build program for nuclear energy globally. The strong project pipeline is expected to strengthen the outlook for the Chinese nuclear power market, which has previously suffered from regulatory headwinds stemming from the government's decision to suspend approvals for nuclear reactors until a re-examination of the plans was concluded after the 2011 Japanese Fukushima Disaster.?
China uses the most advanced technology and stringent standards for developing nuclear power plants and strictly manages the entire life cycle of nuclear power plants from design, construction, and operation to decommissioning. As of October 2022, China had 54 operating nuclear power reactors with a combined capacity of 52.15 GWe.
The Chinese nuclear sector is expected to expand at a robust rate during the forecast period and beyond, with capacity increasing by 10.3% per year between 2018 and 2027, resulting in more than 95 GW of installed nuclear power capacity. This aligns with the aims of decarbonizing the country's electricity generation and amassing nuclear expertise to export technology.?
The Indian government is dedicated to increasing its nuclear power generation capacity to meet the growing electricity demand in the country. According to the Indian government, the country's nuclear capacity is expected to reach about 22.5 GWe by 2031. ?
As of May 2022, the country had 22 operable nuclear reactors with a combined capacity of 6.79 GWe, and eight reactors with a combined capacity of 6.02 GWe are in the construction stage.
South Korea currently generates about one-quarter of its electricity from nuclear power, with a mixture of imported coal and gas used to produce the balance. As of September 2022, the country had 25 operable nuclear reactors with a combined capacity of

24.43 GWe, three reactors with a combined capacity of 4.2 GWe, and two reactors with a combined capacity of 2.8 GWe were under construction, planned, and proposed stages, respectively.?
Therefore, owing to the above factors, Asia-Pacific is expected to witness significant market growth during the forecast period.

Nuclear Power Market Competitor Analysis

The nuclear power market is moderately consolidated. Some of the major players in the market (in no particular order) include GE-Hitachi Nuclear Energy Inc., Westinghouse Electric Company LLC, KEPCO Engineering & Construction, SKODA JS AS, and China National Nuclear Corporation, among others.

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