

Nuclear Power Reactor Decommissioning - Market Share Analysis, Industry Trends & Statistics, Growth Forecasts (2025 - 2030)

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Report description:

The Nuclear Power Reactor Decommissioning Market is expected to register a CAGR of 13.8% during the forecast period.

Although the market studied was moderately impacted by the COVID-19 pandemic in 2020, it has been recovering and reached pre-pandemic levels.

The major factors driving the market's growth are the increasing number of nuclear reactors reaching operational retirement, declining prices of renewable power generation sources (i.e., wind and solar), and growing sensitivity toward environmental issues.

However, the lifetime extension of nuclear power plants with favorable government policies is expected to hinder the market's growth.

Nuclear phase-out policies in several countries, such as Germany, the United Kingdom, and South Korea, are expected to create opportunities for foreign and domestic players to provide the necessary expertise for the country's needs to develop their decommissioning market.

North America is expected to be the fastest-growing market for nuclear power reactor decommissioning, with the United States being one of the significant decommissioning hotspots in the region.

Nuclear Power Reactor Decommissioning Market Trends

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Commercial Reactors Segment is Expected to Dominate the Market

As of October 2022, 437 commercial nuclear power plants were in operation across 32 countries. The United States had the largest nuclear electricity generation capacity and generated more nuclear electricity than any other country. France has the second-largest nuclear electricity generation capacity and second-highest nuclear electricity generation.

Several factors are responsible for the shutdown and decommissioning of commercial nuclear power plants, including economic, regulatory, and social factors. Some primary factors, such as the end of operational life and the fall in the cost of alternative energy generation sources, like solar and wind, made nuclear energy less cost-competitive. Following the Fukushima disaster of 2011, nuclear safety protocols have been upgraded across the world, which levied additional costs for the upgradation of infrastructure and increased operations and maintenance costs. Due to this, operators of many older commercial reactors, which have an operating life of 40 years and can be extended by 20 more years with infrastructural upgrades, are opting to decommission older units.

The policy-level initiatives from governments across the world have also led to the shutdown of nuclear power plants. The governments in many countries planned to reduce nuclear power in the energy mix of their countries. Such regulatory policies are prevalent among Western European states with a strong renewable portfolio and serious concerns about the environmental footprint and potential risk of operating commercial nuclear power plants.

As per its national policy, Germany plans to shut down all its reactors by the end of 2022. In 2017, Switzerland voted to phase-out nuclear power plants from the country. In September 2020, the Belgian government signed an agreement reaffirming its commitment to phasing-out nuclear power by 2025. Spain declared that it will close four of its seven operating commercial reactors by 2030 and close the rest three reactors within the next five years, completely phasing out nuclear generation by 2035.

The development of renewable energy technologies and increasing economic viability have led to its massive development. Countries across the world are creating huge infrastructures pertaining to renewable power, which has offset the requirement for nuclear reactors. Nuclear power generation is being replaced by renewable energy sources, which led to the closure of nuclear reactors. Therefore, the surge in the development of renewable energy sources is a big boost for the global nuclear reactor decommissioning market.

Therefore, due to the aforementioned factors, commercial reactors are expected to dominate the market studied during the forecast period.

North America is Expected to Witness Significant Growth

North America is one of the largest regions in terms of operable reactors worldwide. The nuclear power reactor decommissioning market is expected to witness significant growth due to the demand from the United States, Canada, and Mexico.

The United States is one of the largest nuclear power producers, accounting for 30% of the global nuclear power generated in 2021. The country's nuclear reactors produced 778.15 TWh of electricity in 2021, representing a slight decline of 1.48% from 2020.

As of August 2022, the United States has 92 operating nuclear power reactors with a combined capacity of 94.7 GWe in 30 states, used by 30 different power companies. Two reactors are under construction with a total of 2.23 GWe.

As the era of nuclear power winds down in the United States, the decommissioning of nuclear power plants is becoming a significant industry. Private companies are acquiring these plants, taking over their licenses, liability, decommissioning funds, and

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waste contracts. Around 41 reactors with a combined capacity of 19.97 GW were shut down, the latest being the Palisades nuclear plant in Michigan shut down in May 2022. In December 2021, Holtec International received approval from the Nuclear Regulatory Commission to acquire the Palisades plant in Covert, Michigan, to decommission and dismantle the plant. Around 198 reactors are expected to shut down by 2030.

The nuclear reactor fleet of the United States is aging. The United States Nuclear Regulatory Commission (NRC) is considering applications for extending operating licenses beyond 60 to 80 years with its subsequent license renewal (SLR) program. However, some plant owners recently opted for early retirement of their nuclear units at 45 to 50 years old.

Intense competition from electricity generation using low-cost shale gas hurt the competitiveness of the nuclear power industry in the country. Record low wholesale electricity prices and the high cost of life extension (PLEX) upgrades have together driven early nuclear plant retirements.

For many years, Canada has been a leader in nuclear research and technology, exporting reactor systems developed in Canada. In 2021, Canada generated 92.6 TWh of electricity from nuclear power plants, accounting for about 15% of the total electricity generation mix. In Ontario, 19 operable reactors with a combined capacity of 13,624 MW and around six reactors with a combined capacity of 2.14 GW were shut down in August 2022.

As of August 2022, Canada has a variety of research and prototype power reactors that are no longer in use and have been shut down. These reactors are in a safe storage state and awaiting final decommissioning. Some of these reactors include the WR-1, the NRX reactor at Chalk River Laboratories (CRL), the MAPLE-1 and MAPLE-2 (Multipurpose Applied Physics Lattice Experiment) reactors at CRL, the Gentilly-1 nuclear generating station in Becancour, QC, the Nuclear Power Demonstration (NPD) reactor in Rolphton, ON, and the Douglas Point nuclear-generating station in Kincardine, ON. These are expected to drive the demand for the Canadian nuclear power reactor decommissioning market during the forecast period.

Therefore, North America is expected to witness significant growth in the nuclear power reactor decommissioning market during the forecast period.

Nuclear Power Reactor Decommissioning Industry Overview

The nuclear power reactor decommissioning market is moderately fragmented. Some of the major players in the market (in no particular order) are Babcock International Group PLC, Fluor Corporation, GE Hitachi Nuclear Services, AECOM, and Westinghouse Electric Company.

Additional Benefits:

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

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