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Power Plant Boiler Market - Global Industry Size, Share, Trends, Opportunity, and Forecast, Segmented By Type (Pulverized Coal Tower Boiler, Circulating Fluidized Bed Boiler and Others), By Technology (Subcritical, Supercritical and Ultra-Supercritical), By Fuel Type (Gas Based, Coal Based, Oil Based and Others) By Region & Competition, 2021-2031F

https://marketpublishers.com/r/PE25E0A92997EN.html
Date: January 2026
Pages: 180
Price: US$ 4,500.00 (Single User License)
ID: PE25E0A92997EN

Abstracts

The Global Power Plant Boiler Market is projected to expand from USD 26.18 Billion in 2025 to USD 37.24 Billion by 2031, registering a CAGR of 6.05%. A power plant boiler functions as a specialized pressure vessel designed to transform water into steam through the burning of fuels like coal, natural gas, or biomass, thereby driving turbines for electricity generation. The principal force propelling this market is the growing global demand for dependable baseload energy to support rapid industrialization and urbanization within emerging nations. Additionally, the necessity to upgrade aging infrastructure to improve thermal efficiency guarantees ongoing procurement activity. As noted by the International Energy Agency, global electricity demand increased by 4% in 2024, highlighting the continuous strain on power systems to augment their capacity.

Conversely, the market faces substantial obstacles arising from rigorous environmental regulations and carbon emission goals that deter investment in conventional fossil-fuel-based energy generation. Such regulatory pressures force utilities to redirect capital spending toward renewable energy options, subsequently decreasing the installation of traditional thermal power plants. As a result, manufacturers are burdened with escalating costs related to compliance and emission control technologies, which can hinder the development of new projects in areas that prioritize aggressive decarbonization strategies.

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Market Driver

Increasing capital allocation toward thermal power capacity serves as a major catalyst for the global boiler market, spurred by the critical requirement for stable baseload electricity in developing economies. As nations such as India and China persist in their industrial growth, they are investing heavily in coal-fired generation to guarantee energy security and address peak demand spikes that renewable sources cannot yet adequately cover. This trajectory is demonstrated by ambitious capacity expansion goals and the resurgence of thermal projects. For example, the Press Information Bureau, Government of India, reported in January 2025 that 19.2 GW of new coal-based thermal capacity was awarded in 2024 to satisfy the country's growing peak electricity needs. Similarly, the National Bureau of Statistics of China revealed in March 2025 that the nation's installed thermal power capacity reached 1,444 GW by the close of 2024, illustrating the continued reliance on fossil fuels in these rapidly expanding regions.

Concurrently, the uptake of ultra-supercritical boiler technology is transforming procurement trends as utilities endeavor to adhere to tighter environmental emission standards without sacrificing output. Manufacturers are observing a clear move toward high-efficiency, low-emission boiler systems that function at increased temperatures and pressures, effectively lowering coal consumption per unit of electricity produced. This technological shift is driving power producers to substitute older sub-critical units with advanced infrastructure. Notably, Business Standard reported in August 2025 that Adani Power secured a Letter of Intent to establish a 2,400 MW ultra-supercritical thermal power plant in Bihar, highlighting the industry's strategic pivot toward high-efficiency combustion technologies to minimize carbon footprints while maintaining energy generation.

Market Challenge

Rigorous environmental regulations and carbon emission objectives pose a significant obstacle to the expansion of the global power plant boiler market. As countries pledge to follow aggressive decarbonization routes, power utilities are increasingly forced to divert capital expenditures away from infrastructure reliant on traditional fossil fuels. This regulatory strain effectively curtails the operational duration of existing thermal assets and dissuades the launch of new boiler-intensive projects, as corporations aim to evade the financial perils linked to stranded assets. Consequently, manufacturers encounter a distinct decrease in procurement activities for conventional boilers, with

market demand pivoting strongly toward renewable alternatives that do not necessitate such combustion technologies.

This shrinkage in the available market for thermal power equipment is corroborated by recent industry statistics indicating a reduction in conventional capacity. According to the Global Energy Monitor, operating coal power capacity outside of China fell by more than 9 gigawatts in 2024, as plant retirements outpaced new commissions. This decline in the active installed base directly restricts the boiler market by reducing opportunities for both new unit sales and extensive modernization contracts in regions that are implementing strict climate mandates.

Market Trends

The incorporation of biomass co-firing capabilities within coal boilers is becoming a pivotal trend, allowing utilities to reduce carbon intensity without retiring operational thermal assets. Power producers are increasingly modifying existing pulverized coal units to mix biomass pellets with fossil fuels, a tactic that utilizes established infrastructure to fulfill renewable portfolio standards and prolong the economic lifespan of plants. This strategy facilitates a gradual shift to cleaner energy while alleviating the financial risks connected to stranded assets in coal-dependent areas. As reported by Argus Media in December 2025 regarding Indian coal plants, biomass consumption in the nation's thermal power sector hit 1.62 million tonnes between April 2024 and March 2025, marking a fourfold rise driven by regulatory requirements to decarbonize the grid.

At the same time, the retrofitting and modernization of aging boiler fleets is gaining momentum, with a particular emphasis on fuel conversion initiatives that switch facilities from high-emission heavy fuels to natural gas. As environmental rules become more stringent, operators are prioritizing the alteration of combustion systems and pressure parts to handle cleaner-burning fuels, thereby decreasing particulate matter and sulfur oxide emissions while enhancing overall plant adaptability. This wave of modernization is crucial for preserving grid stability in markets that are transitioning away from coal and oil yet still require reliable baseload capacity. For example, Mitsubishi Power announced in a November 2025 press release that it had won a contract to upgrade boiler equipment at the O Mon 1 Thermal Power Plant in Vietnam, a strategic endeavor intended to enable the plant's switch from residual fuel oil to natural gas firing.

Key Market Players

Mitsubishi Hitachi Power Systems Ltd

Dongfang Electric Corporation Ltd

IHI Corporation

Doosan Heavy Industries & Construction

Siemens AG

Thermax Ltd.

GE Alstom

Babcock & Wilcox Co.

Bharat Heavy Electricals Ltd.

Harbin Electric Company

Report Scope

In this report, the Global Power Plant Boiler Market has been segmented into the following categories, in addition to the industry trends which have also been detailed below:

Power Plant Boiler Market, By Type

- Pulverized Coal Tower Boiler
- Circulating Fluidized Bed Boiler and Others

Power Plant Boiler Market, By Technology

- Subcritical
- Supercritical and Ultra-Supercritical

Power Plant Boiler Market, By Fuel Type

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- Gas Based
- Coal Based
- Oil Based and Others

Power Plant Boiler Market, By Region

- North America
  - United States
  - Canada
  - Mexico
- Europe
  - France
  - United Kingdom
  - Italy
  - Germany
  - Spain
- Asia Pacific
  - China
  - India
  - Japan
  - Australia

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South Korea

South America

Brazil

Argentina

Colombia

Middle East & Africa

South Africa

Saudi Arabia

UAE

Competitive Landscape

Company Profiles: Detailed analysis of the major companies present in the Global Power Plant Boiler Market.

Available Customizations:

Global Power Plant Boiler Market report with the given market data, TechSci Research offers customizations according to a company's specific needs. The following customization options are available for the report:

Company Information

Detailed analysis and profiling of additional market players (up to five).

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