

# Global 100% Hydrogen Firing Boiler Supply, Demand and Key Producers, 2026-2032

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## Abstracts

The global 100% Hydrogen Firing Boiler market size is expected to reach \$ 226 million by 2032, rising at a market growth of 34.2% CAGR during the forecast period (2026-2032).

A 100% hydrogen firing boiler is a boiler unit or packaged system designed to use hydrogen as the sole fuel and to deliver thermal energy—such as steam or hot water—through stable full-load combustion within its rated operating conditions and defined safety limits. Its defining features include combustion and safety control architectures specifically engineered and validated for pure hydrogen service (e.g., hydrogen fuel train, ignition and purge sequences, leak detection, and safety interlocks), enabling sustained operation while complying with applicable local regulations and emissions requirements (e.g., NO<sub>x</sub> limits). In 2025, global production of 100% hydrogen firing boilers reached 24 units, with an average selling price of USD 1.04 million per unit.

A 100% hydrogen firing boiler (100% Hydrogen Firing Boiler) refers to a boiler unit or packaged system that uses hydrogen as the actual operating fuel, achieves 100% hydrogen ignition and stable combustion during project acceptance or demonstration operation, and continuously delivers steam or hot water. The sector is in a transition from “demonstration” to “small-scale commercialization.” Demand is primarily driven by industrial decarbonization (process steam/process heat), district heating and heat-network pilots, and low-carbon retrofits for large public buildings, while the residential segment contributes close to zero due to constraints in hydrogen supply infrastructure and compliance frameworks. From a regional perspective, Europe is the leading market, supported by the combined effects of hydrogen valleys/heat-network pilots, public-sector demonstration procurement, and stringent emissions compliance. North America is characterized mainly by a small number of industrial users and project-based retrofits.

The Middle East and North Africa see large projects in hydrogen-rich settings such as refining and chemicals. Asia-Pacific remains largely in validation and small-scale demonstration stages. In terms of product mix, hot-water and high-temperature hot-water units are better suited to heat networks and building heating, whereas steam boilers align more closely with industrial process applications. By capacity, the market forms a three-tier structure: 100 kW–1 MW modular condensing units, 1–10 MW cascaded boiler plants, and >10 MW large water-tube boilers or main-boiler fuel-conversion projects. Based on projects that actually operate on pure hydrogen, the application split is 55% industrial process steam and process heat, 30% district heating/heat networks, and 15% large public buildings and campus/industrial park heating. Pricing is distinctly project-based. For small- to mid-capacity packaged units, quotations typically bundle “equipment + hydrogen fuel train + interlocks + NOx control + commissioning and acceptance,” with average prices fluctuating with compliance requirements, hydrogen supply conditions, and on-site engineering scope. For large water-tube boilers and main-boiler conversion projects, the overall engineering scope dominates, lifting single-project values and amplifying year-to-year volatility. On the cost side, the core components include pressure parts and heat-transfer surfaces (steel, welding, and NDT), hydrogen burners and fuel trains (valve trains/pressure regulation/metering/double block-and-bleed/venting), combustion control and safety interlocks (BMS/purge and ignition/flame supervision/leak detection/ESD), NOx control (FGR/staged combustion/post-treatment), as well as on-site engineering and certification testing. The share of “safety and compliance systems + commissioning/acceptance” is materially higher than for natural-gas boilers, pushing up both average selling prices and delivery lead times. Gross margins vary significantly by project type: more standardized packaged units typically achieve 25%–30%, while EPC/turnkey projects are constrained by subcontracting and execution risk, resulting in margins of 15%–18%. On the manufacturing side, “single-line capacity” can be used to describe scale-up potential. For 100 kW–1 MW packaged condensing boilers, the single-line capacity of a final assembly and test line is 5–10 units per year. For medium-to-large water-tube boilers and deep conversion projects, the single-line capacity of an assembly and test line is 10–20 units per year, with bottlenecks more closely tied to pressure-part fabrication, end-to-end testing capability, and project delivery resources. Upstream supply includes steel and hydrogen-resistant materials, valves and instrumentation, control systems and sensors, and NOx-abatement components. The midstream consists of boiler OEMs and combustion-system suppliers. Downstream demand comes from industrial users, heat-network operators, and public-building owners, with projects often orchestrated by EPC contractors and system integrators. The competitive landscape is led by a limited number of boiler OEMs with proven and certified pure-hydrogen firing capability, alongside a small group of system providers

that master hydrogen combustion control and safety-interlock architectures. Key technical and compliance barriers center on pure-hydrogen combustion stability (flashback/explosion-risk control), achieving low-NOx compliance, plant-level safety logic, and third-party certification testing. Looking ahead, the market is expected to accelerate its shift from “ready” to “firing,” with business models evolving from single-unit sales toward packaged boiler islands and modular boiler plants. On the product side, stronger adoption of FGR and lower-NOx pathways, plus digital remote monitoring and predictive maintenance, will become more prominent; regionally, declining hydrogen costs and replication of hydrogen-valley projects are likely to enable a more sustainable scaling trajectory after 2027.

This report studies the global 100% Hydrogen Firing Boiler production, demand, key manufacturers, and key regions.

This report is a detailed and comprehensive analysis of the world market for 100% Hydrogen Firing Boiler and provides market size (US\$ million) and Year-over-Year (YoY) Growth, considering 2025 as the base year. This report explores demand trends and competition, as well as details the characteristics of 100% Hydrogen Firing Boiler that contribute to its increasing demand across many markets.

### **Highlights and key features of the study**

Global 100% Hydrogen Firing Boiler total production and demand, 2021-2032, (Units)

Global 100% Hydrogen Firing Boiler total production value, 2021-2032, (USD Million)

Global 100% Hydrogen Firing Boiler production by region & country, production, value, CAGR, 2021-2032, (USD Million) & (Units), (based on production site)

Global 100% Hydrogen Firing Boiler consumption by region & country, CAGR, 2021-2032 & (Units)

U.S. VS China: 100% Hydrogen Firing Boiler domestic production, consumption, key domestic manufacturers and share

Global 100% Hydrogen Firing Boiler production by manufacturer, production, price, value and market share 2021-2026, (USD Million) & (Units)

Global 100% Hydrogen Firing Boiler production by Type, production, value, CAGR,

2021-2032, (USD Million) & (Units)

Global 100% Hydrogen Firing Boiler production by Application, production, value, CAGR, 2021-2032, (USD Million) & (Units)

This report profiles key players in the global 100% Hydrogen Firing Boiler market based on the following parameters - company overview, production, value, price, gross margin, product portfolio, geographical presence, and key developments. Key companies covered as a part of this study include Bosch, Viessmann Climate Solutions (Carrier), Babcock & Wilcox, Kawasaki Thermal Engineering, Miura Co Ltd, Hydrogen Technologies, LLC, etc.

This report also provides key insights about market drivers, restraints, opportunities, new product launches or approvals.

Stakeholders would have ease in decision-making through various strategy matrices used in analyzing the World 100% Hydrogen Firing Boiler market

### **Detailed Segmentation:**

Each section contains quantitative market data including market by value (US\$ Millions), volume (production, consumption) & (Units) and average price (K US\$/Unit) by manufacturer, by Type, and by Application. Data is given for the years 2021-2032 by year with 2025 as the base year, 2026 as the estimate year, and 2027-2032 as the forecast year.

Global 100% Hydrogen Firing Boiler Market, By Region:

United States

China

Europe

Japan

South Korea

ASEAN

India

Rest of World

Global 100% Hydrogen Firing Boiler Market, Segmentation by Type:

Steam Boilers

Hot Water Boilers

Global 100% Hydrogen Firing Boiler Market, Segmentation by Project Type:

New-build

Retrofit

Global 100% Hydrogen Firing Boiler Market, Segmentation by Sales Channel:

Direct Sales

Distribution

Global 100% Hydrogen Firing Boiler Market, Segmentation by Application:

Commercial

Industrial

Residential

Companies Profiled:

Bosch

Viessmann Climate Solutions (Carrier)

Babcock & Wilcox

Kawasaki Thermal Engineering

Miura Co Ltd

Hydrogen Technologies, LLC

**Key Questions Answered:**

1. How big is the global 100% Hydrogen Firing Boiler market?
2. What is the demand of the global 100% Hydrogen Firing Boiler market?
3. What is the year over year growth of the global 100% Hydrogen Firing Boiler market?
4. What is the production and production value of the global 100% Hydrogen Firing Boiler market?
5. Who are the key producers in the global 100% Hydrogen Firing Boiler market?
6. What are the growth factors driving the market demand?

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