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Waste Heat Recovery System Market Forecasts to 2032 – Global Analysis By Type (Flue Gas, Organic Rankine Cycle (ORC), Heat Recovery Steam Generators (HRSG), Waste Heat Boilers, Heat Exchangers, and Other Types), Source, Technology, Temperature, Application, End User and By Geography

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Abstracts

According to Stratistics MRC, the Global Waste Heat Recovery System Market is accounted for $68.59 billion in 2025 and is expected to reach $149.75 billion by 2032 growing at a CAGR of 11.8% during the forecast period. A Waste Heat Recovery System (WHRS) is a technology designed to capture and reuse heat that would otherwise be lost in industrial processes, power generation, or manufacturing operations. By recovering this waste heat, the system improves overall energy efficiency, reduces fuel consumption, and lowers operational costs. WHRS can generate electricity, provide heating, or assist in cooling applications. Commonly used in sectors such as cement, steel, and power plants, it contributes to sustainability by reducing energy waste and minimizing environmental impact.

According to the Industry Dive update, in June 2023, the price of electricity increased by 14.3% in 2022, due to inflation in the U.S.

Market Dynamics:

Driver:

Increased awareness of carbon footprint reduction

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The growing emphasis on reducing carbon emissions is driving the adoption of waste heat recovery systems. These systems help industries capture and reuse thermal energy that would otherwise be wasted, significantly lowering their carbon footprint. Governments and organizations worldwide are implementing stricter environmental regulations, encouraging industries to adopt sustainable practices. Waste heat recovery systems not only contribute to environmental sustainability but also offer cost-saving benefits by improving energy efficiency. Industries such as cement, steel, and chemicals are increasingly integrating these systems into their operations to meet sustainability goals.

Restraint:

Fluctuating energy prices

The volatility of energy prices poses a challenge to the widespread adoption of waste heat recovery systems. When energy prices are low, industries may find it less economically viable to invest in these systems. High initial costs and the need for significant capital investment further exacerbate this issue. Additionally, fluctuating energy prices can impact the return on investment for waste heat recovery projects. This uncertainty often deters smaller companies from adopting such technologies.

Opportunity:

Rising industrialization in emerging economies

Emerging economies are experiencing rapid industrialization, creating a significant opportunity for the waste heat recovery system market. As industries expand, the demand for energy-efficient solutions to optimize production processes is increasing. Governments in these regions are promoting sustainable industrial practices, further driving the adoption of waste heat recovery systems. The integration of advanced technologies in these systems enhances their efficiency and makes them more appealing to industries. Additionally, the growing focus on reducing operational costs aligns with the benefits offered by waste heat recovery systems.

Threat:

Lack of awareness and expertise

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Numerous sectors, particularly smaller businesses, might not be completely aware of the advantages or uses of WHRS, which could lead to lost chances for sustainability and energy savings. Furthermore, the technological intricacy of setting up and maintaining these systems calls for certain expertise, which is sometimes absent in several industries. Companies may find it difficult to put in place efficient processes without the right knowledge, which could result in less than ideal performance and increased operating expenses. This lack of understanding may hinder market uptake and reduce the potential financial and environmental benefits that WHRS provides to a range of sectors.

Covid-19 Impact:

The COVID-19 pandemic temporarily disrupted the Waste Heat Recovery System (WHRS) market due to halted industrial activities, supply chain disruptions, and reduced investments in energy-efficient technologies. Many projects were delayed or put on hold as industries focused on managing the immediate impacts of the crisis. However, the pandemic also highlighted the importance of sustainable energy solutions, leading to a post-pandemic recovery driven by an increased emphasis on cost reduction, energy efficiency, and environmental sustainability in industrial sectors.

The heat exchangers segment is expected to be the largest during the forecast period

The heat exchangers segment is expected to account for the largest market share during the forecast period, driven by their ability to efficiently transfer heat between fluids, enhancing energy recovery. Increasing industrial energy costs, stringent environmental regulations, and a growing focus on sustainability are key factors boosting their adoption. Heat exchangers help improve process efficiency, reduce energy consumption, and lower operational costs, making them vital for industries like manufacturing, power generation, and chemical processing.

The electricity generation segment is expected to have the highest CAGR during the forecast period

Over the forecast period, the electricity generation segment is predicted to witness the highest growth rate, owing to the need for energy efficiency and sustainability. As industries seek to reduce operational costs and carbon emissions, utilizing waste heat for power generation becomes increasingly attractive. Technological advancements in Organic Rankine Cycle (ORC) and other recovery methods, along with government incentives and stricter environmental regulations, are further accelerating the adoption

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of WHRS for electricity generation across various sectors.

Region with largest share:

During the forecast period, the Asia Pacific region is expected to hold the largest market share, due to rising energy demand, and a growing focus on energy efficiency. Countries like China and India are key players, with increasing investments in manufacturing, cement, and steel industries. Strict environmental regulations, government initiatives promoting sustainable energy, and the need for cost reduction in energy-intensive sectors further fuel the adoption of WHRS technologies across the region.

Region with highest CAGR:

Over the forecast period, the North America region is anticipated to exhibit the highest CAGR, driven by increasing energy efficiency regulations, rising industrial energy costs, and a strong focus on sustainability. The push for reducing carbon emissions, alongside government incentives and environmental policies, encourages industries to adopt WHRS technologies. Additionally, advancements in waste heat recovery technologies and the need for enhanced energy recovery in sectors like manufacturing and power generation further boost market growth.

Key players in the market

Some of the key players in Waste Heat Recovery System Market include Siemens AG, SABIC, General Electric (GE), Aalborg CSP, Schneider Electric, Ormat Technologies Inc., Mitsubishi Heavy Industries Ltd., Turboden S.p.A., Bosch Thermotechnology, Avenisense, Clyde Bergemann Power Group, Kaishan Compressor Co., Ltd., Exergy, Caterpillar Inc., and Thermax Limited.

Key Developments:

In March 2025, Siemens announces an extended collaboration with Microsoft in the context of Siemens Xcelerator, Siemens' open digital business platform, to simplify the integration of information technology (IT) and operational technology (OT) for enterprise customers. By combining Siemens Industrial Edge with Microsoft Azure IoT Operations, customers will benefit from complementary solutions that enable a seamless flow of data from production lines to the edge and to the cloud.

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In March 2025, GE Vernova Inc. and Amazon Web Services, Inc (AWS), an Amazon.com, Inc. company announced the signing of a strategic framework agreement (SFA) aimed at supporting AWS's data center scaling, and collaborating to address increasing global energy demand, advance grid security and reliability, and decarbonize electric power systems.

Types Covered:

- Flue Gas
- Organic Rankine Cycle (ORC)
- Heat Recovery Steam Generators (HRSG)
- Waste Heat Boilers
- Heat Exchangers
- Other Types

Sources Covered:

- High-Temperature Waste Heat
- Low-Temperature Waste Heat

Technologies Covered:

- Thermoelectric Generators (TEG)
- Vapor Compression and Absorption
- Thermal Energy Storage

Temperature Covered:

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100°C to 230°C

231°C to 450°C

Above 450°C

Applications Covered:

Preheating

Steam and Power Generation

Cooling

District Heating

Electricity Generation

Other Applications

End Users Covered:

Oil & Gas

Manufacturing & Industrial

Automotive

Food & Beverage

Petroleum Refining

Chemical

Cement

Metal Production & Foundries

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- Pulp & Paper
- Other End Users

Regions Covered:

- North America
  - US
  - Canada
  - Mexico
- Europe
  - Germany
  - UK
  - Italy
  - France
  - Spain
  - Rest of Europe
- Asia Pacific
  - Japan
  - China
  - India
  - Australia

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New Zealand

South Korea

Rest of Asia Pacific

South America

Argentina

Brazil

Chile

Rest of South America

Middle East & Africa

Saudi Arabia

UAE

Qatar

South Africa

Rest of Middle East & Africa

What our report offers:
- Market share assessments for the regional and country-level segments
- Strategic recommendations for the new entrants
- Covers Market data for the years 2024, 2025, 2026, 2028, and 2032
- Market Trends (Drivers, Constraints, Opportunities, Threats, Challenges, Investment Opportunities, and recommendations)
- Strategic recommendations in key business segments based on the market estimations
- Competitive landscaping mapping the key common trends

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- Company profiling with detailed strategies, financials, and recent developments
- Supply chain trends mapping the latest technological advancements

Free Customization Offerings:

All the customers of this report will be entitled to receive one of the following free customization options:

Company Profiling

Comprehensive profiling of additional market players (up to 3)

SWOT Analysis of key players (up to 3)

Regional Segmentation

Market estimations, Forecasts and CAGR of any prominent country as per the client's interest (Note: Depends on feasibility check)

Competitive Benchmarking

Benchmarking of key players based on product portfolio, geographical presence, and strategic alliances

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Note: Tables for North America, Europe, APAC, South America, and Middle East & Africa Regions are also represented in the same manner as above.

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