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Waste Heat Recovery System Market Research Report - Forecast to 2030

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Description:

Global Waste Heat Recovery Market Overview:

Waste Heat Recovery Market Size was valued at USD 62.9 billion in 2021. The waste heat recovery market industry is projected to grow from USD 68.6 Billion in 2022 to USD 127.2 billion by 2030, exhibiting a compound annual growth rate (CAGR) of 9.2% during the forecast period (2022 - 2030). The rising concerns about greenhouse gas (GHG) emissions and rigorous laws to reduce carbon footprint are the major market drivers enhancing the market growth. Additionally, ongoing technological developments like waste heat recovery with an organic rankine cycle will further expand the waste heat recovery market.

Global Waste Heat Recovery Market Overview

Source: MRFR Database, primary research, secondary research, and analyst review

Waste Heat Recovery Market Trends

Rising energy demand to boost the market growth

The increasing need for energy, economic growth, and rising electricity prices are some of the key factors driving the global industry. Numerous industries are using more energy than ever before to produce goods. The primary energy usage was 93 quadrillion Btu, based on U.S. Energy Information Administration statistics. The developed world's industrialization has led to a rise in energy demand. Companies are developing various methods to turn waste heat into electricity in response to the growing need for energy. As a result, it is fueling the expansion of the waste heat recovery sector. Thus the growing energy demand has enhanced the waste heat recovery market CAGR globally in recent years.

Figure 1: Worldwide primary energy usage from 2000 to 2021

Worldwide primary energy usage from 2000 to 2021

Source: MRFR Database, primary research, secondary research, and analyst review

Countries have helped to recover and utilize waste heat directly or indirectly. In Denmark, several policies encourage waste heat recovery systems, including laws on district cooling, electrical heating, taxation, subsidies, and heat price regulation. The Italian Energy Management Authority (ARERA) adopted the eligibility of Waste Heat Recovery in the White Certificate Scheme in 2011, with the EEN 9-11, giving a 5-year advantage. Therefore, increased government initiatives to curb greenhouse gases are another factor driving the growth of the waste heat recovery market revenue.

Waste Heat Recovery Market Segment Insights:

Waste Heat Recovery Technique Insights

The Waste Heat Recovery Market segmentation, based on technique, includes heat exchangers, heat wheels, recuperators, regenerators, boilers, and others. During the forecast period, the demand for heat exchangers is anticipated to increase due to the increased focus on effective thermal management in several industries, including oil & gas, power generation, chemical & petrochemical, food & beverage, and HVAC & refrigeration.

- November 2020: ALFA LAVAL opened a new plant in San Bonifacio, Italy, to manufacture brazed heat exchangers (BHE). The new plant will have more capacity to handle customers' increased demand for heat exchangers. Furthermore, the facility has an advanced research lab for

refrigerant research and training institutes. This expansion has further broadened the growth opportunity for the waste heat recovery industry.

- Additionally, in 2021, the boiler segment witnessed the fastest growth rate. The sector is anticipated to be driven by rapid industrialization and the expanding food and beverage sector during the projected period.

Waste Heat Recovery Application Insights

The Waste Heat Recovery Market data has been bifurcated by application into temperature control, pre-heating systems, electricity generation, and others. Power and steam generation accounted for the majority of application segments with respect to the Waste Heat Recovery Market revenue. The deployment of waste heat recovery for power and steam generation will be aided by rising electricity costs and continued attempts to minimize GHG emissions. The demand for onsite power generation is increasing, and improving plant efficiency is a major focus.

Figure 2: Waste Heat Recovery Market, by Application, 2021 & 2030 (USD Billion)

Source: MRFR Database, primary research, secondary research, and analyst review

The second fastest-growing segment in the waste heat recovery industry is the preheating system. The main uses of waste heat recovery systems are preheating combustion air, furnace loads, boiler feed water, and space heating. The waste heat recovery cascade system is boosting product demand.

Waste Heat Recovery Industries Insights

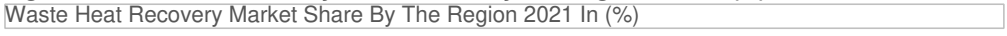
Based on Industries, the global waste heat recovery industry has been segmented into chemical & petrochemical, oil & gas, energy & power, food & beverages, and others. A major portion went to chemicals and petrochemical. This industry uses waste heat recovery technologies for thermal cracking, refining, and catalytic treatment. However, the cement end-user category is anticipated to develop significantly during the projected period. The growing number of cement plants in developing nations like China and India will lead to more waste heat recovery installations, fueling sector growth. Hence, the rising use of waste heat recovery in the cement industry positively impacts market growth.

Waste Heat Recovery Regional Insights

By Region, the study provides market insights into North America, Europe, Asia-Pacific and Rest of the World. The North America Waste Heat Recovery market accounted for USD 27.12 billion in 2021 and is expected to exhibit a significant CAGR of 43.2 percent growth during the study period. The demand for this region's waste heat recovery market has expanded due to rising onsite power generation and solid economic stability. About 4.11 trillion kilowatt-hours (kWh) of energy were produced by utility-scale electricity-producing facilities in the US in 2021, which is approximately 4,108 billion kWh.

Further, the key countries studied in the market report are The U.S, Germany, Canada, UK, France, Italy, Spain, China, Japan, India, Australia, South Korea, and Brazil.

Figure 3: Waste Heat Recovery Market Share By The Region 2021 In (%)



Source: MRFR Database, primary research, secondary research, and analyst review

Europe's waste heat recovery market accounts for the second-largest market share. The European Union's measures to produce electricity from waste and the growing public awareness of waste heat recovery systems have been major waste heat recovery market growth drivers in this region. Germany's new administration, with encouragement from its coalition partner, the Greens party, toughened its climate protection law last year and has set the ambitious aim of accelerating the spread of renewable energy to 80% of electricity by 2030. Further, the German waste heat recovery market held the largest market share, and the UK waste heat recovery market was the fastest-growing market in the European region.

The Asia-Pacific Waste Heat Recovery Market is expected to grow at the fastest CAGR from 2022 to 2030. The abundance of cement, paper and pulp, metal processing, and production sectors in this area also fuels the demand for waste heat recovery systems. By a wide margin, China will produce the most cement in the world in 2021, with an estimated 2.5 billion metric tonnes produced. Moreover, China's waste heat recovery market held the largest market share, and the Indian waste heat recovery market was the fastest-growing market in the Asia-Pacific region.

Waste Heat Recovery Key Market Players & Competitive Insights

The market will rise due to major market players investing a lot of money in R&D to broaden the range of products they provide. Along with significant market developments like introducing new

products, contractual agreements, mergers and acquisitions, increased investments, and collaboration with other organizations, market participants are participating in several strategic initiatives to increase their global reach. Waste heat recovery industry rivals must provide competitively priced items to grow and remain in this increasingly competitive market.

Local production to cut operational costs is one of the main business methods manufacturers use in the global waste heat recovery industry to help customers and increase the market sector. Some of the most significant medical advances have come from the waste heat recovery industry. The waste heat recovery market major player such as, including Ormat Technologies Inc. (U.S.), Siemens AG (Germany), Thermax Limited (India), and ABB Ltd. (Switzerland), is attempting to increase market demand by funding R&D projects.

Boyd Corporation is a company that offers superior sealing, thermal management, and protection systems. Bonding, adhesive systems, extrusions, linear, gasket seals, air, conduction, liquid cooling, and related accessories are all available from the company. In January 2021, BOYD Corporation opened a new production plant in Juarez, Mexico, to extend its North American activities. The company will manufacture thermal systems and diverse engineered materials in an automated facility fueled by renewable energy. The quality management system will be accredited for the 40,000 square-meter facility.

Also, Ormat Technologies, Inc. is a multinational corporation headquartered in Reno, Nevada. Ormat provides geothermal energy technology that is both alternative and renewable. The company has constructed over 190 power plants and installed over 3,200 MW capacity. It owned and operated 933 MW of geothermal and recovered energy-based power facilities as of January 2021. In December 2020, Ormat Technologies Inc. finalized the acquisition of a 25-MW shovel-ready energy storage project in Upton County, Texas, from Consolidated Edison Inc. subsidiary Consolidated Edison Development Inc. According to a Dec. 16 news release, the project is co-located with a 157-MW solar photovoltaic complex owned and operated by CED Upton County Solar LLC.

List of Key Companies in the waste heat recovery market include

- Alstom SA (France)
- ABB Ltd. (Switzerland)
- Amec Foster Wheeler (U.K.)
- Ormat Technologies Inc. (U.S.)
- General Electric Co. (U.S.)
- Mitsubishi Heavy Industries Ltd. (Japan).
- Echogen Power Systems Inc. (U.S.)
- Econotherm Ltd. (U.K.)
- Thermax Limited (India)
- Siemens AG (Germany)
- China Energy Recovery Inc. (China)
- Cool Energy Inc. (U.S.)
- Among others.

Waste Heat Recovery Industry Developments

December 2022: Mutares SE & Co. KGaA has finalized the acquisition of Siemens Energy B.V.'s Heat Transfer Technology. This new platform investment will operate under NEM Energy B.V. and boost the Engineering & Technology section.

February 2021: Siemens Energy has agreed to commission an innovative waste heat-to-power pilot plant in Alberta with Canada-based TC Energy Corporation (TC Energy). The facility will transform waste heat from a gas-fired turbine at a pipeline compression station into emissions-free power.

Waste Heat Recovery Market Segmentation

Waste Heat Recovery Technique Outlook

- Heat Exchangers
- Heat Wheels
- Recuperators

- Regenerators
- Boilers
- Others

Waste Heat Recovery Application Outlook

- Temperature Control
- Pre-Heating Systems
- Electricity Generation
- Others

Waste Heat Recovery Industries Outlook

- Chemical & Petrochemical
- Oil & Gas
- Energy & Power
- Food & Beverages
- Others

Waste Heat Recovery Regional Outlook

- North America
    - US
    - Canada
- Europe
    - Germany
    - France
    - UK
    - Italy
    - Spain
    - Rest of Europe
- Asia-Pacific
    - China
    - Japan
    - India
    - Australia
    - South Korea
    - Australia
    - Rest of Asia-Pacific
- Rest of the World
    - Middle East
    - Africa

- Latin America

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