

# **Server Farm Heat Reutilization Market Forecasts to 2032 – Global Analysis By Data Center Size (Hyperscale Data Centers, Enterprise Data Centers and Colocation Data Centers), Technology (Direct Liquid Cooling, Air-to-Water Heat Exchangers, Heat Pumps and Other Emerging Technologies), Application and By Geography**

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## **Abstracts**

According to Statistics MRC, the Global Server Farm Heat Reutilization Market is accounted for \$652.8 million in 2025 and is expected to reach \$1178.1 million by 2032 growing at a CAGR of 8.8% during the forecast period. Server farm heat reutilization involves capturing waste heat generated by data centers and repurposing it for district heating, industrial processes, or power generation. This approach addresses both energy efficiency and sustainability by reducing carbon footprints and lowering energy costs. Market growth is driven by rising global data center expansion, sustainability regulations, and demand for greener IT infrastructure. Integration with smart grids and urban heating networks enhances application potential. Innovations in heat exchangers and recovery systems are shaping the adoption of heat reutilization solutions.

According to IEA analysis reported in early 2024, data center electricity use was about 460 TWh in 2022 and could reach 650–1,050 TWh by 2026, driving interest in efficiency measures and heat recovery from server farms.

Market Dynamics:

Driver:

## Rising data center energy consumption

The exponential growth in global data traffic, fueled by AI, IoT, and hyperscale computing, is the primary driver for server farm heat reutilization. This surge drastically increases energy consumption and waste heat output, creating both an economic and environmental imperative for its capture. Additionally, stringent government regulations on carbon emissions and energy efficiency are compelling operators to adopt sustainable practices. This confluence of high energy demand and regulatory pressure directly stimulates investment in waste heat recovery technologies, transforming a liability into a potential asset and revenue stream, thereby propelling market growth.

### Restraint:

#### Technical complexity of heat transfer

A significant restraint is the intricate technical challenge of efficiently transferring low-grade waste heat from data centers to a viable external application. The logistical complexity of integrating with district heating networks or industrial processes requires substantial capital investment and specialized engineering. Moreover, the low temperature of server exhaust heat often necessitates secondary heat pump systems to elevate it to useful levels, adding cost and reducing the overall system efficiency. This technical and economic barrier can deter adoption, particularly for retrofitting existing data center infrastructure, thereby limiting immediate market penetration.

### Opportunity:

#### Growth of green data center initiatives

Corporations are increasingly mandated to report on sustainability, making green data center initiatives a strategic priority. This corporate shift unlocks investment for heat reutilization projects as a tangible method to reduce Scope 2 emissions and improve power usage effectiveness (PUE). Furthermore, partnerships with municipal district heating companies offer a stable, long-term revenue model for selling captured thermal energy, enhancing project viability and accelerating market development beyond mere regulatory compliance.

### Threat:

#### Risk of system inefficiency

The predominant threat to market adoption is the risk of implementing a heat recovery system that operates below expected efficiency thresholds. If the energy required to capture, transfer, and upgrade the waste heat approaches or exceeds its useful output, the project's economic and environmental benefits are nullified. This risk of negative ROI can severely undermine stakeholder confidence and deter future investments. Additionally, such failures could attract further regulatory scrutiny and cast doubt on the feasibility of heat reutilization as a viable decarbonization strategy for the sector.

#### Covid-19 Impact:

The COVID-19 pandemic initially disrupted supply chains and delayed project deployments, temporarily stifling market growth. However, the crisis accelerated digital transformation, leading to a sustained surge in demand for cloud services and data storage. This increased data center capacity ultimately heightened energy consumption and waste heat generation, reinforcing the long-term need for efficient thermal management solutions. Consequently, the pandemic underscored the critical role of data centers and amplified the business case for energy resilience and sustainability, positively influencing the market's trajectory post-initial disruption.

The hyperscale data centers segment is expected to be the largest during the forecast period

The hyperscale data centers segment is expected to account for the largest market share during the forecast period due to their immense scale and concentrated energy consumption. These facilities, operated by major cloud providers, generate vast quantities of waste heat at a single location, making the implementation of heat recovery systems economically and logistically feasible. Their significant capital expenditure capabilities allow for investment in advanced sustainability infrastructure. Moreover, their corporate commitments to achieving carbon neutrality act as a powerful internal driver, positioning them as the primary adopters of large-scale heat reutilization technologies.

The heat pumps segment is expected to have the highest CAGR during the forecast period

Over the forecast period, the heat pumps segment is predicted to witness the highest growth rate, as they are critical enablers for effective waste heat reutilization. Server exhaust heat is low-grade, limiting its direct application. Heat pumps are essential for

upgrading this thermal energy to higher temperatures suitable for district heating or industrial processes. Advances in refrigerant and compressor technology are improving their efficiency and operational range. Additionally, supportive policies promoting electrification and renewable heating solutions are directly fueling the adoption of high-capacity industrial heat pumps within this market.

Region with largest share:

During the forecast period, the North America region is expected to hold the largest market share, driven by the high concentration of hyperscale data centers, particularly in the United States. The region benefits from strong technological adoption, significant investments in data infrastructure, and the presence of major cloud service providers with aggressive carbon reduction targets. Furthermore, a mature ecosystem for energy innovation and early adoption of sustainable technologies provides a conducive environment for deploying heat recovery projects, solidifying its leadership position in the market.

Region with highest CAGR:

Over the forecast period, the Europe region is anticipated to exhibit the highest CAGR, propelled by the European Union's stringent regulatory framework focused on energy efficiency and carbon neutrality, such as the Energy Efficiency Directive. The widespread presence of district heating networks across Nordic and Western European countries provides a ready-made offtake infrastructure for captured waste heat. Moreover, high energy costs and strong governmental incentives for renewable heating solutions create a highly favorable economic landscape for investing in server farm heat reutilization projects, accelerating market growth.

Key players in the market

Some of the key players in Server Farm Heat Reutilization Market include Asetek, Alfa Laval, Danfoss, ENGIE, Fortum, Hewlett Packard Enterprise, LiquidStack, Microsoft, Schneider Electric, Statkraft, Vertiv, Vattenfall, and Veolia.

Key Developments:

In January 2025, Veolia ANZ announced an advanced thermal energy network for Hobart's Macquarie Point, explicitly noting the capture and redistribution of waste heat, including from data centers, within a smart local energy loop.

In June 2024, Danfoss announced a partnership with Hewlett Packard Enterprise to launch “HPE IT Sustainability Services – Data Center Heat Recovery,” combining HPE’s modular DCs with Danfoss heat reuse modules and heat pumps to recover and reuse excess heat.

In February 2024, Fortum posted an update on the Microsoft x Fortum data center region in the Helsinki area, confirming the plan to transfer emission-free waste heat from Microsoft’s new facilities into Fortum’s district heating system as a major share of the heat mix in Espoo, Kauniainen, and Kirkkonummi.

#### Data Center Sizes Covered:

Hyperscale Data Centers

Enterprise Data Centers

Colocation Data Centers

#### Technologies Covered:

Direct Liquid Cooling

Air-to-Water Heat Exchangers

Heat Pumps

Other Emerging Technologies

#### Applications Covered:

District Heating

Residential Heating

Commercial Building Heating

Agricultural Applications

Aquaculture

Power Generation

Other Applications

Regions Covered:

North America

US

Canada

Mexico

Europe

Germany

UK

Italy

France

Spain

Rest of Europe

Asia Pacific

Japan

China

India

Australia

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
- 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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