SCOTTS INTERNATIONAL

Data Center Cooling Market - Global Outlook & Forecast 2032-2028

Market Report | 2023-07-12 | 478 pages | Arizton Advisory & Intelligence

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Report description:

The global data center cooling market is expected to grow at a CAGR of 6.36% from 2022 to 2028.

KEY HIGHLIGHTS

- Heat management is a crucial concern for data centers as it can lead to equipment failure and data loss. Thus, it is imperative to implement effective cooling systems to regulate the temperature of processors and peripherals.
- Data centers follow cooling standards that dictate the design, adoption, and operation of cooling systems and equipment to ensure optimal cooling. ASHRAE provides industry-standard guidelines and recommendations for installing these cooling systems.
- Operators seek cost-effective and sustainable solutions to improve their cooling systems while conserving space and reducing power consumption.
- Hybrid liquid cooling, plant-based immersion, waterless, and river water cooling are some of the efficient solutions in the data center cooling market that operators are considering reducing their CAPEX and OPEX.
- CRAC and CRAH units dominate the cooling systems market, accounting for around 35% of the overall data center cooling market share. CRAH units are becoming increasingly popular among operators as they operate without a compressor, resulting in higher efficiency and lower power consumption than CRAC units. This makes them an excellent choice for operators looking to incorporate sustainability into their facilities and is expected to drive the market for CRAH units during the forecast period.

SEGMENTATION ANALYSIS

Segmentation by Infrastructure
- Cooling Systems
- Other Mechanical Infrastructure

Segmentation by Cooling Systems
- CRAC & CRAH Units

- Chiller Units
- Cooling Towers, Condensers, and Dry Coolers
- Economizers & Evaporative Coolers
- Other Cooling Units

Segmentation by Cooling Technique
- Air-based Cooling Technique
- Liquid-based Cooling Technique

Segmentation by Tier Standards
- Tier I & II
- Tier III
- Tier IV

Segmentation by Geography
- North America
o The U.S.
o Canada
- Latin America
o Brazil
o Mexico
o Chile
o Colombia
o Rest of the Latin American Countries
- Western Europe
o The U.K.
o Germany
o France
o Netherlands
o Ireland
o Switzerland
o Italy
o Spain
o Belgium
o Other Western European Countries
- Nordics
o Sweden
o Denmark
o Norway
o Finland & Iceland
- Central & Eastern Europe
o Russia
o Poland
o Other Central & Eastern European Countries
- Middle East
o UAE
o Saudi Arabia

o Qatar
o Israel
o Other Middle Eastern Countries
- Africa
o South Africa
o Kenya
o Nigeria
o Egypt
o Other African Countries
- APAC
o China
o Hong Kong
o Australia
o New Zealand
o India
o Japan
o Taiwan
o South Korea
o Rest of APAC
- Southeast Asia
o Singapore
o Indonesia
o Malaysia
o Thailand
o Philippines
o Vietnam
o Other Southeast Asian Countries

KEY TRENDS

Advancements in Artificial Intelligence

- The data center market is experiencing significant growth in advanced technology adoption, particularly AI and ML. Countries across the globe have substantially started adopting AI for several operations. For instance:
I. The UK government proposed the Digital Information and Data Protection Bill and pro-innovation AI regulations, investing USD 2.63 billion in AI since 2014.
II. Italy released its National AI Strategy to improve public administration through AI and digital transformation.
III. In Brazil, 25% of large enterprises use AI and ML technologies.
IV. The Australian government invested USD 30 million to support AI research transfer to small and medium-sized businesses.
- Liquid cooling is the most popular cooling technology in HPC data centers supporting AI and ML workloads. In the forecast period, liquid immersion cooling will become the industry standard in the data center cooling market due to its ability to improve energy efficiency, scalability, and speed. This trend will likely shift away from traditional cooling methods associated with high energy consumption costs, significant carbon footprint, and excessive water usage.

Growing Rack Power Density

- Rack power density is increasing due to technologies such as AI and ML, which require high levels of processing, with AI servers

requiring 1kW/rack unit.
- HPC systems have setups running between 20-40 kW/rack, with deployments reaching up to 50 kW/rack.
- Efficient cooling technologies, mainly liquid cooling systems, must keep high-density racks running.
- The increasing rack power density will drive the adoption of efficient liquid cooling systems to maintain competitiveness in the data center cooling market.

Innovation in Data Center Cooling Technologies

- In the rapidly evolving data center market, operators constantly look for innovative and sustainable cooling solutions to meet the growing demand for high-density computing. As a result, vendors constantly research and develop new technologies to help operators keep up with the ever-changing market. For instance:

I. ST Telemedia Global Data Centers and PTT Digital Solutions signed an agreement to investigate using cold energy from LNG regasification to cool a data center in Thailand to reduce energy consumption by 20-30%.

II. OVHCloud announced the release of a hybrid liquid cooling technology that combines water and dielectric fluid in vertically sealed server tanks, reducing CAPEX and annual power consumption by 7% and 20%, respectively.

III. Chindata collaborated with Vertiv to launch X-Cooling, a waterless cooling system that achieves a PUE of less than 1.1 and saves around 1.2 million tons of water annually at its Hebei data center.

- Vendors investing in developing innovative cooling technologies and offering sustainable and efficient cooling solutions will likely emerge as key players in the data center cooling market.

Operators Reducing Water Usage

- Using traditional or legacy cooling methods, a data center with a 1 MW capacity can consume up to 26 million liters of water per year, contributing to water scarcity and severe drought in certain regions. This highlights the urgent need for sustainable and water-efficient cooling solutions in the data center industry.
- In response to the growing concerns around water scarcity and sustainability, operators have recognized the need to take a proactive approach to reduce their water consumption and environmental impact. Many operators have committed to becoming water positive in the coming years to achieve this goal.

I. Amazon Web Services announced its goal to become water positive in November 2022.

II. Google aims to be water positive by 2030 and to restore 120% of the water consumed by its data centers and offices.

III. Microsoft and Meta also aim to be water positive by 2030 and to restore more water than they consume on a global scale. For instance, In October 2022, Meta implemented measures to reduce water usage by raising server room temperatures to 32.2?C and reducing humidity.

- The demand for air-based cooling systems will increase during the forecast period due to low water usage and operational costs.

COMPETITIVE ANALYSIS

- Several major data center cooling systems market vendors include Stulz, Vertiv, Rittal, Schneider Electric, and Huawei. These vendors collaborate with operators to provide reliable and innovative cooling solutions that meet their needs.
- Schneider Electric offers Uniflair Indirect air economizers, which use polymer air-to-air heat exchangers to provide data centers with customizable and efficient indirect cooling solutions.

Key Data Center Cooling Infrastructure Vendors

- Airedale International Air Conditioning
- Rittal
- Schneider Electric

- STULZ
- Vertiv

Other Prominent Data Center Cooling Infrastructure Vendors

- 3M
- 4ENERGY
- Airsys
- Alfa Laval
- AAON
- Aqua Cooling Solutions
- Aquila Group
- Asetek
- Austin Hughes Electronics
- Canovate Electronics
- Carrier
- Chilldyne
- Citec International
- ClimateWorx
- Cooler Master
- Condair Group
- Coolit Systems
- Daikin Applied (Daikin Industries)
- Data Aire
- DCX (LIQUID COOLING COMPANY)
- Degree Controls
- Delta Group
- ebm-papst
- EMICON INNOVATION AND COMFORT
- Envicool
- FlaktGroup
- Fuji Electric
- Green Revolution Cooling (GRC),
- HiRef
- Huawei Technologies
- Iceotope
- ION
- Johnson Controls
- Kelvion Holding
- KyotoCooling
- Legrand
- Lennox International
- LiquidCool Solutions
- LiquidStack
- Menerga
- Midas Green Technologies
- Minkels

- Motivair Cooling Solutions
- Munters
- Nortek Air Solutions
- nVent
- OceanAire
- QCooling
- Renovo Zhuhai
- Shanghai Shenglin M&E Technology
- SPX Cooling Technologies
- Stellar Energy
- Submer
- Swegon Group
- SWEP International
- Systecon
- Trane (Ingersoll Rand)
- United Metal Products (UMP)
- Upsite Technologies
- USystems
- Vigilant
- Wakefield-Vette

KEY QUESTIONS ANSWERED:

1. How big is the data center cooling market?
2. What is the growth rate of the global data center cooling market?
3. Which region holds the most significant global data center cooling market share?
4. What are the key trends in the data center cooling market?
5. Who are the key vendors in the global data center cooling market?

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