APAC Data Center Cooling Market Landscape 2024-2029

Market Report | 2024-08-22 | 119 pages | Arizton Advisory & Intelligence

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Report description:

The APAC data center cooling market size by investment is expected to grow at a CAGR of 10.12% from 2023 to 2029.

KEY TRENDS

Rising Adoption of AI will drive demand for Advanced Cooling Technologies.

-As the use of AI applications continues to grow in data centers, power distribution complexity will increase. AI adoption will increase the demand for cooling systems because data centers constantly increase their rack power density, increasing the load of data centers.
-AI, IoT, and ML consume a lot of data, producing heat in the data center. Data centers have adopted the latest cooling technology, which is less cost-effective and eco-friendly.
-The demand for the latest cooling technology will increase rapidly in two to three years, and many data centers are using traditional cooling methods to convert to the latest cooling technologies because of AI.

Growing Rack Power Density

-As a data center adopts advanced technologies like AI and ML, power demands per rack can reach 20 kW to 80 kW per rack and generate substantial heat. Effective cooling is crucial to prevent equipment failures and downtime but consumes significant energy. Given rising energy costs and environmental regulations, there is a growing need for more energy-efficient cooling solutions.
-Liquid cooling technology has become a highly effective solution to the heat challenge data centers face. According to the Uptime Institute, advanced liquid cooling is more cost-effective and efficient when the rack density goes beyond 20 kW to 25 kW.
-Cloud service providers such as Amazon Web Services (AWS) and major internet companies such as Meta often operate at higher power densities, ranging from 10 kW to 14 kW per rack. For newer high-density AI workloads, the power density can surpass 20 kW per rack.

-In January 2024, STACK Infrastructure announced its plan to enhance its AI data center capabilities better to accommodate the growing needs of ML and heavy workloads. The company intends to support high-density workloads using a closed-loop water cooling system. It plans to offer customizable solutions, enabling support for up to 50 kW with rear door heat exchangers and up to 100 kW using direct-to-chip liquid-based cooling. In addition, it aims to facilitate a power rating of 300 kW or higher per rack with immersion cooling technology in the future.

Innovations in Data Center Cooling Techniques

-As computing power requirements and performance expectations continue to rise, driven by advances in technologies, including Artificial Intelligence (AI), the Internet of Things (IoT), and Machine Learning (ML), the demand for power usage will increase; this will result in elevated temperatures in both data center infrastructure and IT equipment.
-The growth of liquid-based cooling techniques is higher among direct liquid-based and immersion cooling solutions. The adoption of chilled water systems is likely to decline over the next few years due to the growing need for cooling solutions that do not require water to reduce the water consumption in the data centers. Data center operators also constantly install on-site water tanks, water treatment plants, and recycling plants to reduce water consumption.

Adoption of Liquid-Cooling Techniques

-In December 2023, Equinix announced plans to expand its support for liquid-based cooling technology, including direct-to-chip cooling, to over 100 International Business Exchange (IBX) data centers across more than 45 metro areas globally. Locations set to support direct-to-chip liquid-based cooling include London, Silicon Valley, Singapore, and Washington DC.
-In August 2023, Digital Realty launched a high-density rack that supports up to 70 kW per rack over 28 locations across North America, EMEA, and APAC. The company said this is possible due to the latest technologies in cooling systems, such as Air-Assisted Liquid Cooling (AALC) technologies.

SEGMENTATION INSIGHTS

-The APAC region mostly has a warm climate, and data centers that operate in warm climatic conditions adopt free-cooling chillers with smart technologies since they enable operations based on outside temperatures.
-The adoption of chiller units is expected to be high in India, Southeast Asia, and the rest of APAC. Multiple data centers are considering adopting free-cooling chillers in China, Japan, South Korea, Australia, and New Zealand. This is because most operators slowly move toward evaporative coolers, considering the PUE benefits these systems offer in terms of operation.
-A few data centers have been developed in APAC to benefit from free cooling techniques. Hence, the adoption of indirect evaporative cooling systems is expected to increase in China, Japan, South Korea, Australia, and New Zealand during the forecast period. The modern offerings of vendors include a combination of systems that use cold air outside during winter.
-A few data centers have been developed in APAC to benefit from free cooling techniques. Hence, the adoption of indirect evaporative cooling systems is expected to increase in China, Japan, South Korea, Australia, and New Zealand during the forecast period. The modern offering of vendors in the APAC data center cooling market includes a combination of systems that use cold air outside during winter.
-The growth of liquid-based cooling techniques is higher among direct liquid-based cooling and immersion cooling solutions; the adoption of chilled water systems will likely decline over the next few years due to the growing need for cooling solutions that do not require water to reduce water consumption in data centers.

The report includes the investment in the following areas:

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

GEOGRAPHICAL ANALYSIS

-China held the largest APAC data center cooling market share in terms of investment, with around 45% share in 2023, followed by Australia, India, Hong Kong, South Korea, New Zealand, and the rest of the APAC countries.
-In 2023, there was a substantial increase in data center investments within the region. This surge was propelled by a rise in internet users, a heightened presence on social media platforms, widespread smartphone usage, an increased embrace of cloud services, and a growing necessity for enterprises to shift from server room setups to more advanced data center environments.
-Singapore stands out as a key hub for data center investments in Southeast Asia, thanks to the significant presence of both local and international data center operators.
-The increasing reliance on digital services, the growth of content providers, expanding internet penetration, and the widespread adoption of cloud services are anticipated to fuel the demand for data generation, data traffic, and robust storage and connectivity solutions. Consequently, this surge in demand is expected to drive the establishment and expansion of data centers and propel the APAC data center cooling market growth.

-APAC
oChina
oHong Kong
oAustralia
oNew Zealand
oIndia
oJapan
oSouth Korea
oTaiwan
oRest of APAC
-Southeast Asia
oSingapore
oIndonesia
oMalaysia
oThailand
oPhilippines
oVietnam
oOther Southeast Asian Countries

VENDOR LANDSCAPE

-The APAC data center cooling market hosts various active vendors offering different types of solutions. Vendors that provide innovative and advanced technologies stand a better chance of securing a larger market share throughout the forecast period.
-Some of the prominent cooling infrastructure providers operating in the APAC data center cooling market include 4energy,3M, Asetek, Black Box, Carrier, Condair, Daikin Applied, Delta Electronics, Johnson Controls, Mitsubishi Electric, STULZ, Schneider Electric Rittal, Vertiv, and others.
-In the APAC data center cooling market, many colocation operators are adopting advanced cooling technologies in their data centers. This new technology involves submerging computer servers in a special liquid that helps keep them cool. This will increase opportunities for vendors offering advanced cooling solutions to increase their revenue share in the APAC data center cooling industry. For instance, in May 2024, LG Uplus announced that it had developed a new data center in Paju, South Korea. The company also announced that it is equipped with an immersion cooling system.
-In August 2023, Digital Realty launched a high-density rack that supports up to 70 kW per rack over 28 locations across North America, EMEA, and APAC. The company said this is possible due to the latest technologies in cooling systems, such as Air-Assisted Liquid Cooling (AALC) technologies.

VENDORS LANDSCAPE

-Cooling Infrastructure Providers
-3M
-4Energy
-Aermac
-Airedale
-AIRSYS
-Alfa Laval
-Asetek
-Austin Hughes
-Black Box
-Carrier
-CITEC International
-ClimateWorx International
-Condair
-Cooler Master
-CoolIT Systems
-Colt International
-CONTEG
-Daikin Applied
-Degree Controls
-Delta Electronics
-Eaton
-ebm-papst
-EcoColling
-Envicool
-Excool
-FlaktGroup
-Fujitsu

-Fuji Electric
-Green Revolution Cooling
-Huawei
-Iceotope Technologies
-Johnson Controls
-Kelvion
-Kyoto Cooling
-Legrand
-Lennox International
-LiquidCool Solutions
-LiquidStack
-Mitsubishi Electric
-Motivair
-Munters
-Nortek Air Solutions
-nVent
-Prasa
-Renovo Zhuhai
-Rittal
-Schneider Electric
-Shanghai Shenglin M&E Technology
-Siemens
-SPX Cooling Technologies
-Stellar Energy
-STULZ
-Submer
-Swegon
-SWEP
-Systecon
-Systemair
-Trane
-Upsite Technologies
-Vertiv
-Wakefield Thermal

KEY QUESTIONS ANSWERED:

1. How big is the APAC data center cooling market?
2. What is the growth rate of the APAC data center cooling market?
3. Which country holds the most significant APAC data center cooling market share?

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