

Data Center Cooling Market - Growth, Trends, Covid-19 Impact, and Forecasts (2023 - 2028)

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Report description:

The data center cooling market was valued at USD 10.96 billion last year, and it is expected to reach USD 21.42 billion in the next five years and witness a CAGR of 13.76% over the forecast period. There has been a surge in data centers due to high computational requirements by AI and media applications. Furthermore, the growth is likely to be fuelled by the adoption of edge computing and the increase in IoT devices.

Key Highlights

The data center liquid cooling market is poised to showcase significant gains propelled by the rise in digitization leading to an increase in computing power, demanding the integration of large chips into data centers. Powerful hardware for Artificial Intelligence (AI) workloads is reshaping the design of data centers and their cooling requirements. Manufacturers are introducing large semiconductor chips to optimize the performance for AI and High-Performance Computing (HPC) workloads. Using powerful GPUs in AI and HPC environments supports the need for data center cooling technologies.

The growing use of OTT and streaming services has resulted in increased data volumes, fueling market development. The increasing amount of data generated by online streaming services, such as Disney+ Hotstar, Hulu, and Netflix, will drive the demand for data center cooling systems that deliver effective cooling performance. In the market, there is a rising need to ensure that data center cooling providers have the capacity and capability to provide high-performance products that can work efficiently during peak traffic periods.

A green data center is where data is stored, managed, and distributed. The mechanical, lighting, electrical, and computer systems are planned to be as energy-efficient as possible while minimizing their adverse environmental effects. Innovative techniques and technologies are used in building and running green data centers. With the exponential growth and usage of the internet, power consumption in data centers has increased significantly. Companies are under more pressure to adopt a green policy due to the environmental impact, rise in public awareness, higher cost of energy, and governmental action. These factors have made the

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development of sustainable data centers directly drive the data center cooling market.

However, adaptability requirements and power outages are challenging the market to grow. A typical data center cooling system must be pre-engineered, standardized, and modular. It is required to be scalable and flexible to meet the needs of the data center, which is very difficult in today's world, with companies looking to cut costs and not willing to spend much on high-end customized cooling systems.

The datacenter cooling market was negligibly affected by the COVID-19 pandemic. Activities by enterprises, such as data center consolidation, were put on temporary hold. Due to mandatory social distance regulations, physical movements of servers, closing buildings, and opening new spaces were more complicated. This upsurge resulted in massive demand for data centers globally. However, post-pandemic, the tremendous savings saw a switch to up-front CapEx investments in information technology. The usage of cloud services has also grown, leading to new technological and operational disciplines. The above factors are expected to increase the need for data center cooling market, and the market is expected to witness an uptrend during the forecast period.

Data Center Cooling Market Trends

Information Technology Industry to Witness Highest Growth

The IT industry needs on-premise private data storage and hyperscale data centers for its operations according to the organization's size. Additionally, the adoption of cloud storage has increased over the years due to growth in SaaS providers, enabling cloud storage providers to expand their capacities, which is expected to increase the demand for data center cooling systems.

Cloud storage providers, like Microsoft, AWS, and Google, are expanding their storage capabilities to offer more efficient workflow on the cloud. These companies are making investments in hyperscale deals. In June 2022, Microsoft and Meta joined Google in using AI to help run their data centers, as the heat generated by its new tensor processing units (TPUs) exceeded the limits of its previous data center cooling solutions.

The information technology (IT) market consists of sales of information technology (IT) services and related goods by entities such as organizations, sole traders, and partnerships that apply computers, computer peripherals, and telecommunications equipment to store, retrieve, transmit and maneuver data. The IT market involves computer networking, broadcasting, systems design services, information distribution technologies like television and telephones, and other equipment used during the process. These huge requirements need a cooling system for the devices to perform normally, which drives the demand for the data center cooling market.

The cooling system is essential in the IT and data center sector, owing to the need for enhanced high-quality cooling solutions that are more efficient than the traditional air-cooling solution. Also, the surge in technological innovation in IT infrastructure, coupled with the rise in demand for cooling systems among smartphone manufacturers for thermal management, is driving the market growth.

Moreover, CloudHQ stated that by the end of this year, the industry is expected to get 350-megawatt storage campuses. In 2022, the company plans to work on new data centers in Chaska and Illinois. It partnered with ComEd, Dominion Energy, and Vizsla Ventures LLC to build new campuses by creating IT opportunities. Also, Albertsons Companies announced the adoption of a cloud storage service from Microsoft to improve the retail experience. With this, the company planned to leverage Microsoft's cognitive analytics, AI, and data science capabilities. Such advancements among top retailers are expected to launch new data center establishments, driving the demand for the data center cooling market.

Asia-Pacific to Register a Significant Growth

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Asia-Pacific to witness high market growth in the future. China is one of the significant markets for data center cooling solutions, owing to the exponential growth in data generation due to advanced technologies such as IoT, ML, and artificial intelligence, along with the government's policies to support more energy-efficient infrastructure in the country. India has witnessed the second-largest growth due to the increasing adoption of internet services and the high flow of data.

Rising government investments in data centers are propelling the Asia-Pacific market. According to Arizton's latest report, the APAC market witnessed an addition of over 100 hyperscale data center facilities and expansion projects this year. Last year, the investment in higher-speed Ethernet switches remained strong, driven mainly by the demand from hyperscale data centers, cloud providers, and an increase in data center investments. With hyperscale facilities growing, adopting these high-capacity switches will surpass, increasing the need for data center cooling systems.

According to the Energy Consumption of Data Centers in China, the current numbers of small- and medium-sized data centers in China exceeded 400,000, and the annual total power demand reached 100 billion kWh, i.e., around 250,000 kWh for each data center, annually. Also, the rising trend of data localization in the country may further promote the development of data centers. Cloud service providers such as AWS, Microsoft, Google, Huawei, and Alibaba are increasing their reach in APAC by opening multiple cloud regions. Significant investment by these operators is also driving the market in APAC. This year, Amazon plans to complement its network of massive data centers in the Asia-Pacific region by building smaller local zones. It has announced that it will produce 10 local zone data centers in six countries: Australia, India, New Zealand, the Philippines, Thailand, and Vietnam. Such developments drive the demand for data center cooling market in this region.

The growing demand for liquid cooling systems for data centers in the domestic market is also fueling foreign players to invest in the Japanese data center cooling market. For instance, a distributed data center company, Cloud&Heat Technologies, has shipped a container-based system to a Japanese vendor who plans to sell the German firm's liquid-cooled offerings in the local market. Enterprises in the market are concerned about the chillers' water consumption and efficiency in terms of cooling and energy consumption. However, vendors are focusing on upgrading their offerings to overcome such hurdles. For example, Prasa deployed intelligent chiller boosters in the cooling systems of data centers, primarily for supercomputers, in the Ministry of Earth Sciences, Government of India. This system decreased electricity consumption by nearly 38% and increased cooling efficiency by 43%.

Data Center Cooling Market Competitor Analysis

The data center cooling market is fragmented as the benefits offered by the technology and support from the government by imposing efficiency regulations on data centers are expected to help the growth of the data center cooling market directly. Market penetration is growing with a strong presence of major players in established markets. With the increasing focus on innovation, the demand for new technologies is growing, which, in turn, is driving investments for further developments. Key players include Vertiv Co., Schneider Electric SE, and STULZ GMBH.

In October 2022, a technology infrastructure and colocation firm, Aligned Data Centers, made two new land acquisitions in Phoenix, Arizona, to build two new mega campuses that will total over 400 MW of IT load across 2 million square feet. The new data centers will feature Aligned's patented Delta cooling technology that uses arrays to absorb and remove heat and reduce water flow requirements. The facility will also feature a heat rejection system that uses 85% less water and can run without water as needed.

In May 2022, the digital technology and innovation firm Alibaba Cloud launched its third data center in Germany. It provides a wide range of cloud computing products, from storage and network to databases. The new data center features free cooling operation through dry coolers using naturally cool ambient air in place of mechanical refrigeration with over 7,000 hours of full free cooling in a year.

In April 2022, LiquidStack, the global leader in liquid immersion cooling for data centers, partnered with colocation data center provider Standard Power to build the first large-scale colocation data center in the United States to use 2-phase immersion cooling.

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