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2013

AIRENTERPRISES
Quality...not compromises

2013 North American Data Center Cooling Product Line Strategy Leadership Award

FROST & SULLIVAN

50 Years of Growth, Innovation & Leadership

Product Line Strategy Leadership Award
Data Center Cooling
North America, 2013

Frost & Sullivan's Global Research Platform

Frost & Sullivan is in its 50th year in business with a global research organization of 1,800 analysts and consultants who monitor more than 300 industries and 250,000 companies. The company's research philosophy originates with the CEO's 360-Degree Perspective™, which serves as the foundation of its TEAM Research™ methodology. This unique approach enables us to determine how best-in-class companies worldwide manage growth, innovation and leadership. Based on the findings of this Best Practices research, Frost & Sullivan is proud to present the 2013 North American Product Line Strategy Leadership Award in Data Center Cooling to Air Enterprises.

Key Industry Challenges

Data centers are estimated to consume more than 2 percent of total energy in North America, more than double the estimates from ten years ago. In a legacy data center, cooling costs can account for 40–50 percent of a data center's energy spend. This indicates that data center cooling energy consumption may amount to as much as two-thirds of a percent to one percent of total energy used in North America.

The conventional approach to cooling data centers has not changed much in the last twenty years. It is typically done with computer room air conditioning (CRAC) units, most often coupled with a chilled water tower to provide additional cooling to control hot spots and higher density racks (more servers per rack). Chillers consume the bulk of data center cooling energy, and most new hyper-scale data centers have endeavored to eliminate their use entirely.

The KyotoCooling® system, an Air Enterprises solution, uses free air from outside as the cooling source to cool the data center air rather than circulate air through air conditioning units, as CRAC systems do. With KyotoCooling®, the outside air is passed through filters to remove dust, sand, bacteria, and other particulates and then flows through a patented energy recovery wheel (KyotoWheel™), developed by Air Enterprises, where it captures exhaust heat which is then ejected to the outside. Frost & Sullivan finds that this air-to-air transfer method of energy rejection is 90 percent efficient, the highest in the industry. Using cool outside air rather than traditionally cooled systems can save 75–85 percent of cooling costs.

Key Benchmarking Criteria

The Frost & Sullivan Award for Product Line Strategy Leadership is presented each year to the company with demonstrated excellence in product line strategy and diversification. This award recognizes the company's focus on enhancing the value that its customers

receive by offering a truly innovative product platform, leading to market share growth and ultimately business expansion.

Air Enterprises KyotoCooling® solution was selected under the criteria of price competitiveness, energy efficiency, solution reliability, ease of maintenance, and market penetration potential.

Factor 1: Product ROI and Environmental Conscientiousness

As a fraction of the total energy that data centers consume, cooling can account for between 40 and 50 percent. This can amount to hundreds of thousands, even millions, of dollars a year that could otherwise have been put towards mission-critical pursuits. Frost & Sullivan notes that by using Air Enterprises' KyotoCooling® solution, those costs can be reduced by 75–80 percent; the degree of savings will be affected by the local climate, but the KyotoCooling® system will provide significant savings even in hot, humid climates that are difficult and expensive to cool using traditional systems. Traditional systems typically require a chilled water tower to cool, whereas this system operates without the need for water at all. Eliminating the extensive infrastructure requirements of water systems enables users of the KyotoCooling® system to save not only up-front purchase and installation costs, but also maintenance expenses going forward. Removing water from the data center mitigates the worst-case scenario of a system failure, in which water could escape and damage sensitive electronic equipment.

Energy efficiency in data centers is typically measured using power usage effectiveness (PUE), which is defined as total power used divided by server power used; lower is better. A perfect measure of 1 would indicate that all power used is being directed to servers and that cooling does not utilize any power. Frost & Sullivan's analysis shows that Air Enterprises' KyotoCooling® is able to achieve annualized PUE measures of 1.05-1.2, whereas the industry average is above 2.0.

There is increased media pressure on the data center industry to become more environmentally conscientious. This applies not only to energy, but also to water usage. The KyotoCooling® system can reduce energy use by up to 80 percent and water usage in the data center by 100 percent. This system is one of the most environmentally friendly in existence for data center cooling, which comes with its own advantage of positive media perception.

Factor 2: Reliability and Serviceability

Frost & Sullivan research confirms that the KyotoCooling® system is the most widely used new-generation solution for data center cooling. Across five continents, and hundreds of installations, the KyotoCooling® system has been demonstrated in a real-world setting to be a highly effective cooling mechanism across a wide variety of climates and for a wide variety of rack densities (servers per rack).

The Air Enterprises KyotoCooling® system has the added advantage of being recognizable to data center owners and operators. Air handlers work in much the same way as a traditional CRAC unit in terms of air movement and cooling technique. Many new-generation cooling solutions are seen as untested or unreliable, and very few data center owners will be willing to adopt them without first seeing their reliability and effectiveness demonstrated for several years. This cultural barrier to new-generation data center cooling solutions does not apply to KyotoCooling®, from the recognizeability of the solution to its widespread adoption.

Air Enterprises controls the entire production chain for the KyotoCooling® system. From design and production, to installation and maintenance, Air Enterprises demonstrates confidence in their products and services. One single point of contact makes maintenance easy and reliable.

Frost & Sullivan finds that adopters of this best-in-class air-to-air heat transfer solution include United Airlines, Hewlett Packard, Bell Canada, and Rogers Communications.

Factor 3: Opportunity for Market Penetration

Frost & Sullivan expects Air Enterprises to grow dramatically in the next five years. The data center industry is quickly realizing that traditional cooling systems are neither cost effective nor environmentally sustainable. Owners and operators are actively looking for a solution to these problems, and many have already found that solution in KyotoCooling®. Frost & Sullivan's analysis indicates that the free air cooling sub market will grow dramatically within the coming decade, with Air Enterprises' KyotoCooling® system, as the best-in-class solution, at the forefront of that growth. This trend will be particularly strong in the northern United States and Canadian markets, where the KyotoCooling® solution is able, unaided, to cool very high-density racks for the vast majority of the year. Achieving greater sales volumes will allow Air Enterprises to offer augmented economies-of-scale savings to their customers, which will improve their already impressive value proposition.

Conclusion

In comparison to the competition, the addition of the KyotoCooling® system to their portfolio of solutions distinguishes Air Enterprises product line strategy. Frost & Sullivan independent analysis of the Data Center Cooling market clearly shows that Air Enterprises' KyotoCooling® solution delivers a cost-effective, highly reliable, environmentally friendly solution for data center cooling that fits perfectly into the industry paradigm. Furthermore, Air Enterprises is well suited to deliver economies-of-scale savings to its clients through increased volume and market share in the air handlers sub-market. Based on the aforementioned factors, Frost & Sullivan is proud to present the 2013 North America Product Line Strategy Leadership Award in Data Center Cooling to Air Enterprises.

Critical Importance of TEAM Research

Frost & Sullivan's TEAM Research methodology represents the analytical rigor of our research process. It offers a 360-degree view of industry challenges, trends, and issues by integrating all seven of Frost & Sullivan's research methodologies. Our experience has shown over the years that companies too often make important growth decisions based on a narrow understanding of their environment, leading to errors of both omission and commission. Frost & Sullivan contends that successful growth strategies are founded on a thorough understanding of market, technical, economic, financial, customer, best practices, and demographic analyses. In that vein, the letters T, E, A and M reflect our core technical, economic, applied (financial and best practices) and market analyses. The integration of these research disciplines into the TEAM Research methodology provides an evaluation platform for benchmarking industry players and for creating high-potential growth strategies for our clients.

Chart 1: Benchmarking Performance with TEAM Research
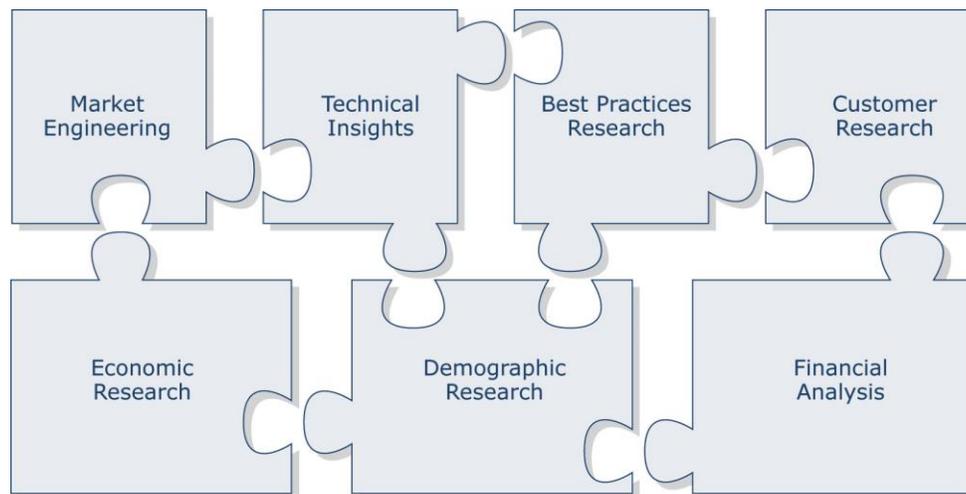
About Frost & Sullivan

Frost & Sullivan, the Growth Partnership Company, enables clients to accelerate growth and achieve best-in-class positions in growth, innovation and leadership. The company's Growth Partnership Service provides the CEO and the CEO's Growth Team with disciplined research and best-practice models to drive the generation, evaluation and implementation of powerful growth strategies. Frost & Sullivan leverages 50 years of experience in partnering with Global 1000 companies, emerging businesses and the investment community from more than 40 offices on six continents. To join our Growth Partnership, please visit http://www.frost.com.