



**2014 Global Data Center Cooling Solutions
New Product Innovation Leadership Award**



FROST & SULLIVAN



50 Years of Growth, Innovation & Leadership

Background and Company Performance

Industry Challenges

The data center cooling industry needs to address both technical and business operations challenges. To keep pace with today's quickly-evolving technical challenges, manufacturers need to constantly incorporate the latest technologies into their products, to enhance system performance and provide the most up-to-date capabilities. However, data center operators must also reduce their CAPEX as well as total cost of ownership (TCO). So the ideal cooling solution must provide a significant reduction in TCO, combined with superior serviceability, monitoring, redundancy, and failure isolation.

RackCDU™ is a new and innovative server-level liquid-cooling system for data centers that has completely changed the way the data center industry views liquid-cooling. It cuts data center IT equipment cooling by 60-80%, with a payback of less than 12 months. It uses industry-standard designs, compatible with all brands of servers, enabling significant cost reductions for server OEMs, while still enabling each OEM to develop unique and differentiated end-products to drive market-share in an otherwise commoditized industry. RackCDU™ can be integrated into all types of data centers, large and small, supercomputing and enterprise, with minimal disruption to day-to-day operations. This makes RackCDU™ not only impactful, but also easy to adopt, positioning it to be a disruptive influence on the data center industry in the next few years.

Visionary Innovation and Product Excellence

Addressing Unmet Needs

The most important and critical need in data center cooling is a significant improvement in energy efficiency. Data center energy consumption is the single largest cost associated with this rapidly growing industry in which cooling costs can account for over 40% of the total operating cost. Asetek's RackCDU™ system employs a "warm water, server level, direct-to-chip, data center liquid cooling system" for data centers that reduces data center IT equipment cooling energy by 60-80% and total data center energy consumption up to 30%. More importantly, RackCDU™ was developed to be simple, easy to install, and easy to operate in all types of data centers (large and small, supercomputing and enterprise), globally. It is this unmet need (efficiency + reliability + simplicity) that really makes Asetek's RackCDU™ product stand-out from its competition, scoring 25% higher than the next competitor in this category.

Asetek has been in the liquid cooling market for more than 15 years, with a long track record of developing innovative, unique, and high-value products for the information technology (IT) industry. It is the world's leading supplier of in-chassis liquid cooling systems for computer workstations and gaming PC markets, with 100% market share of OEM-integrated, liquid-cooling systems. It has shipped over 1.8 million units in the market, sold by leading IT OEMs, including HP, Dell, Asus, Lenovo, Intel, and AMD, meeting the extreme reliability requirements of this industry.

These direct-to-chip liquid cooling systems have even led to ASHRAE modifying data center standards to include certifications for warm water liquid cooling. This industry response has led to major systems integrators, such as Johnson Controls and leading data center design/build firms to adopt RackCDU™ for data center projects.

Effective Use of Mega Trends

Asetek's entire RackCDU™ product line was conceived and developed based on the Mega Trends related to data center energy savings. The company tracks these trends and interfaces with end users in order to get a better understanding of how to best address evolving needs. Over 20% of the company's data center business team is involved in tracking such Mega Trends and interfacing with end users for direct feedback regarding the needs and requirements of the industry. Asetek managed to meet with more than 200 data centers as part of its primary research efforts. This has allowed Asetek to develop RackCDU™ to not only have exceptional performance, but to be largely "transparent" to data center operators, making it easy to install and easy to use (both critical elements to lowering the barrier to adoption of new technologies in the data center market).

The launch of the RackCDU™ product line was strategically aligned to coincide with the timeframe of the data center industry and governments across the world (especially the US Federal Government) prioritizing and focusing on improving energy efficiencies. Asetek was able to do this as a direct result of its meticulous efforts to track and study relevant Mega Trends. This caused Asetek to score almost 30% higher than the next competitor in this category.

Pioneering Best Practices

The data center industry is highly conservative and end users are generally slow to adopt new technologies. Asetek works closely with all levels of the industry, from users to OEM suppliers, industry influencers, and policy-makers in the government. With the help of this model, Asetek reduced the barrier to adoption, thus accelerating market penetration and gaining the first-mover advantage. Another best practice example is that Asetek provides its OEM partners with critical information to help develop unique and differentiated products integrating RackCDU™ that lead to growing market-share for these OEMs. Furthermore, it also extends support to OEM partners by visiting key "high-visibility" end user sites to educate them about the value proposition of its innovative technology. These pioneering best practices caused Asetek to score almost 30% higher than the next competitor in this category.

Blue Ocean Strategy

This is an area where Asetek really stands-out, scoring 80% higher than the next best product in this space. Previous liquid cooling solutions were purpose-built and generally too expensive/complex for most data centers; Asetek, due to its technology innovation excellence, has been able to change the outlook on, and perception of, liquid cooling by introducing RackCDU™.

One of the critical success factors for Asetek's products is that Asetek works directly with original equipment manufacturers (OEMs) to understand their needs and help them develop customized, highly differentiated and high-margin end-products for their markets. This is, perhaps, one of the most compelling aspects of Asetek's product. While it has developed a product that can be used by all OEMs, enabling a very low-cost liquid-cooling solution through standardization and economies of scale, this component still enables server OEMs to develop unique, high-margin products that provide significant differentiation in an otherwise commoditized market. This strategy has been extremely effective in Asetek's desktop market over the past 7 years, allowing them to sell to all of the major OEMs, and yet enabling each OEM to achieve higher margins developing an end-product (incorporating Asetek's "standard" components) that is unique and stands out in the market, based their specific value proposition.

The server industry is perhaps in even greater need of such a "standard yet custom" solution. The OEMs in the commodity server market need new ways to differentiate in the fight for market share and margins. Asetek's RackCDU™ is flexible enough to allow each server OEM to develop its own unique integrated product while at the same time leveraging the economies of scale to deliver those products at a very compelling price-point with high margins.

Asetek's blue ocean strategy has given the company a strong first-mover advantage. In addition to working with OEMs, Asetek works closely with data center designers and energy service companies to develop programs where its technology can be deployed into existing data centers, as well as new data centers. Overall, the success of Asetek's products is primarily the result of its efforts to create awareness, demand and differentiation in these previously non-existent markets.

Products Matched to Customer Needs

One of the critical success factors for Asetek's products is that Asetek works directly with original equipment manufacturers (OEMs) to understand their needs and any potential barriers to adoption (cost, function, or integration-related). It also works directly with end users to understand their needs and drivers. It engages in business development with the end users to catalyze sales for its customers, allowing them to accelerate adoption of its products. RackCDU™ customers have been quite vocal about their satisfaction with Asetek's products. Some examples are Steve Hammond (Director of the world's most efficient data center at NREL in Golden, CO), and Bill Tschudi (one of the world's leading data center efficiency experts from Berkeley Labs).

Excellence in Reliability and Quality

Asetek gives top priority to product reliability and quality; this is proven by the fact that it holds 100% market share of the in-chassis liquid cooling for the workstation and gaming IT markets. OEMs such as Dell and HP are well known for performing extensive due diligence and testing before they put their brand name on any product. Asetek's excellence in quality and reliability has earned the company the respect and confidence of these OEMs, making them extremely proud to collaborate with Asetek.

Product/Service Value

Here too, Asetek's RackCDU™ really separates itself from the pack, scoring 50% higher than the next competitor for Product Value. The primary indicator of Asetek's product excellence is customer value enhancement. The company's primary strategy is to leverage an industry-standardized solution at a drastically lower cost to provide a compelling return-on-investment. This is in stark contrast to the previous liquid-cooling solutions that are only relevant to data centers that value performance over cost savings and ROI. This, in turn, creates a unique and previously unimagined value proposition for customers; Asetek's product provides a payback of less than 12 months, making it cost-effective to deploy in all types of data centers.

For its RackCDU™ product line, the company works directly with end users to measure the energy savings, cost savings, and even solicits user-satisfaction feedback. This strategy not only ensures that Asetek has access to direct data and feedback, allowing it to develop improved products in the future, but it allows enhanced market awareness in terms of the value proposition provided by Asetek's solutions.

Product Design

Asetek's RackCDU™ product represent a completely new way of implementing liquid cooling. Unlike other liquid-cooling technologies, the company offers a simple, low-cost, drop-in solution that works with all brands of servers, enabling cost-effective deployment of liquid cooling in all types of data centers. It can be installed into existing or new data centers with minimal infrastructure impact, minimal impact on operations during installation; it virtually eliminates specialized training of data center staff; and it provides rapid payback (<12 months). This combination has really resonated with end-users, most of whom previously never considered liquid-cooling. Within this framework, product teams at Asetek constantly focus on optimizing product offerings to specific evolving customer needs. These unique characteristics of the RackCDU™ product design caused them to score 43% higher than their competition in this category.

Conclusion

Asetek's RackCDU™ provides ultra-efficient data center liquid cooling to the entire data center industry, thereby addressing the major unmet industry need to improve data center energy efficiency. It has developed a low-cost product with a high ROI for the end-users that is simple to install and use, and has a typical payback of less than 12 months. By leveraging industry standard components into a system that can be customized into unique server products, the RackCDU system enables server OEMs to leverage the cost-benefits of volume manufacturing, while enabling the launch of highly-differentiated server products into an otherwise commodity market. In the past year, Asetek has shipped RackCDU™ systems to sites across the world, including Lawrence Berkeley National Labs, the National Renewable Energy Lab (the world's most efficient data center), the University of Tromso, the US Department of Defense and many others in the United States, Europe, and Japan. In the category of New Product Innovation Leadership,

RackCDU™ product outranked the competition in every single category scored by Frost & Sullivan. The company's dedication towards product innovation is highly commendable; accordingly, Frost & Sullivan recognizes Asetek with the 2014 New Product Innovation Leadership in the Global Data Center Cooling Solutions market.

The Intersection between 360-Degree Research and Best Practices Awards

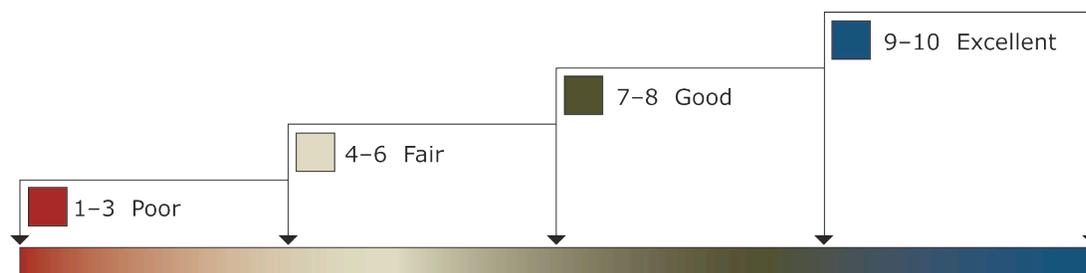
Research Methodology

Frost & Sullivan’s 360-degree 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 7 of Frost & Sullivan’s research methodologies. Too often, companies make important growth decisions based on a narrow understanding of their environment, leading to errors of both omission and commission. Successful growth strategies are founded on a thorough understanding of market, technical, economic, financial, customer, best practices, and demographic analyses. The integration of these research disciplines into the 360-degree research methodology provides an evaluation platform for benchmarking industry players and for identifying those performing at best-in-class levels.



Decision Support Scorecard and Matrix

To support its evaluation of best practices across multiple business performance categories, Frost & Sullivan employs a customized Decision Support Scorecard and Matrix. This analytical tool compares companies’ performance relative to each other. It features criteria unique to each award category and ranks importance by assigning weights to each criterion. The relative weighting reflects current market conditions and illustrates the associated importance of each criterion according to Frost & Sullivan. This tool allows our research and consulting teams to objectively analyze performance, according to each criterion, and to assign ratings on that basis. The tool follows a 10-point scale that allows for nuances in performance evaluation; ratings guidelines are illustrated below.



Best Practice Award Analysis for Asetek

The Decision Support Scorecard, shown below, includes all performance criteria and illustrates the relative importance of each criterion and the ratings for each company under evaluation for the New Product Innovation Leadership Award. The research team confirms the veracity of the model by ensuring that small changes to the ratings for a specific criterion do not lead to a significant change in the overall relative rankings of the companies.

Finally, to remain unbiased and to protect the interests of all organizations reviewed, we have chosen to refer to the other key players in as Company 2 and Company 3.

Decision Support Scorecard: Visionary Innovation

Measurement of 1-10 (1 = poor; 10 = excellent)	Award Criteria					
	Unmet Needs	Use of Mega Trends	Pioneering Best Practices	Blue Ocean Strategy	Aspirational Ideals	Weighted Rating
Visionary Innovation						
Relative Weight (%)	20%	20%	20%	20%	20%	100%
Asetek	10	9	9	9	9	9.2
Company 2	8	7	7	5	6	6.6
Company 3	7	6	7	5	5	6.0

Criterion 1: Unmet Needs

Requirement: A clear understanding of customers' desired outcomes, the products that currently help them achieve those outcomes, and where key gaps may exist

Criterion 2: Use of Mega Trends

Requirement: Ability to incorporate long-range, macro-level scenarios into strategic plans, thereby anticipating and preparing for multiple futures that could occur

Criterion 3: Pioneering Best Practices

Requirement: A nothing-ventured-nothing-gained approach to strategy implementation that results in processes, tools, or activities that generate a consistent and repeatable level of success.

Criterion 4: Blue Ocean Strategy

Requirement: Proven track record of creating new demand in an uncontested market space, rendering the competition obsolete

Criterion 5: Aspirational Ideals

Requirement: A willingness to look beyond the simple goal of generating a profit to embrace a more powerful ideal of bringing greater value to customers or the planet

Decision Support Scorecard: Product Excellence

<i>Measurement of 1-10 (1 = poor; 10 = excellent)</i>	Award Criteria					
	Match to Needs	Reliability and Quality	Product/Service Value	Positioning	Design	Weighted Rating
Product Excellence						
Relative Weight (%)	20%	20%	20%	20%	20%	100%
Asetek	10	8	9	8	10	9.0
Company 2	7	7	6	7	7	6.8
Company 3	6	7	6	6	6	6.2

Criterion 1: Match to Needs

Requirement: Customer needs directly influence and inspire a product’s design and positioning

Criterion 2: Reliability and Quality

Requirement: The product consistently meets or exceeds customer expectations for performance and length of service

Criterion 3: Product/Service Value

Requirement: Products or services offer the best value for the price, compared to similar offerings in the market

Criterion 4: Positioning

Requirement: The product or service delivers a unique, unmet need that competitors cannot easily replicate or replace

Criterion 5: Design

Requirement: The product’s visual presentation makes it easy to use, and makes customers happy to use it

About Frost & Sullivan

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