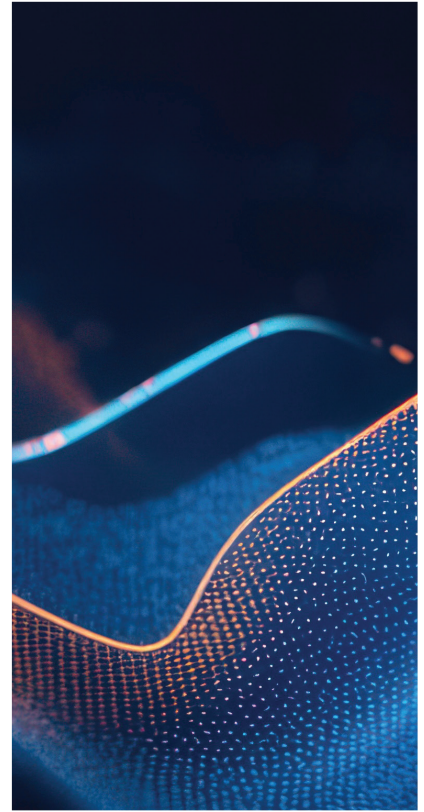
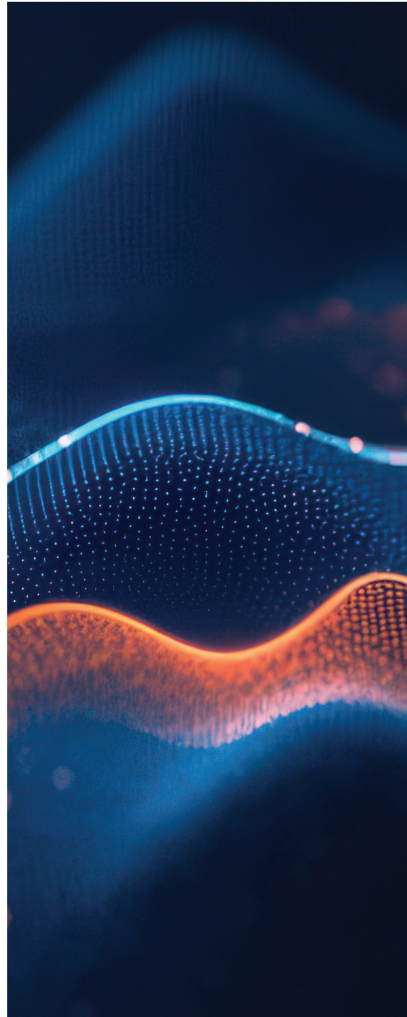


FROST & SULLIVAN
BEST PRACTICES



2026
ASIA PACIFIC
DATA CENTER
BATTERY SYSTEMS

COMPANY OF THE YEAR

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Best Practices Criteria for World-Class Performance

Frost & Sullivan applies a rigorous analytical process to evaluate multiple nominees for each recognition category before determining the final recognition recipient. The process involves a detailed evaluation of best practices criteria across two dimensions for each nominated company. CSB Energy Technology excels in many of the criteria in the Data Center Battery Systems space.

RECOGNITION CRITERIA	
Visionary Innovation & Performance	Customer Impact
Addressing Unmet Needs	Price/Performance Value
Visionary Scenarios Through Megatrends	Customer Purchase Experience
Leadership Focus	Customer Ownership Experience
Best Practices Implementation	Customer Service Experience
Financial Performance	Brand Equity

The Transformation of the Data Center Battery Systems Industry

Where Conventional Batteries Fall Short, Calor XHT Steps In

Modern data centers are redefining what backup power must withstand. Hyperscale expansion, AI-driven compute, and higher rack densities have pushed operators toward warmer ambient environments to save

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Senior Vice President

on cooling costs, even as workloads swing more unpredictably from idle to full load within seconds. CSB Energy Technology recognized that this shift exposed a specific, underappreciated gap in the market. Traditional VRLA batteries, built for stable, tightly controlled standby conditions, began aging prematurely under sustained heat, not because of any defect or warranty failure, but because the operating envelope around them had simply moved. Customers absorbed the cost through more frequent replacements, a slow erosion of total cost of ownership that rarely surfaced until years into deployment.

Other high-temperature batteries existed on the market, but they were built for energy-oriented, telecom-style applications: long, steady discharges measured in hours. Data center backup power behaves differently, demanding short, intense bursts measured in minutes, then long stretches of standby in between. CSB set out to close that gap directly rather than

adapt an adjacent product and call it a fit. The result, the Calor XHT series, was engineered to hold stable performance at elevated ambient temperatures while absorbing short-duration surges, rapid demand swings, and the kind of micro-cycling behaviour increasingly common in AI-driven infrastructure.

CSB did not treat this as a single-product fix. Calor XHT sits within a broader portfolio of high-rate VRLA and lithium-ion solutions, spanning UPS discharge, long-life float operation, and mission-critical deployment, giving customers a way to standardize across use cases while still selecting application-specific chemistry where it matters most. That portfolio logic turned what could have been a narrow point solution into a platform-level response to a structural shift.

The approach has already been tested outside the lab. In one deployment supporting mobile, containerized emergency backup at a major public event, batteries operated without any on-site temperature control while still absorbing power surges reliably, a scenario that would have strained conventional chemistries within months rather than years. Between the root-cause diagnosis, the targeted engineering, and the portfolio strategy built around it, CSB shaped its response around a need that was easy for competitors to overlook and expensive for customers to ignore. That is what makes this a genuine engineering response to where the industry is headed, not a product launched simply to keep pace with it.

Foresight Engineered into the Product Line

Data centers no longer sit still. What was once a static, tightly controlled standby environment is now shaped by four forces moving in parallel: the surge of AI and accelerated computing, which pushes power density up while demand grows harder to predict; a sharpening focus on energy efficiency and sustainability, including how much water cooling infrastructure consumes; the spread of edge and distributed deployments chasing lower latency and near-continuous uptime; and an unrelenting pressure to optimize total cost of ownership rather than just upfront capital spend. CSB Energy Technology built its strategy around reading these shifts early rather than reacting to them after the fact.

The clearest expression of that foresight is Calor XHT. Its development responded directly to the thermal and electrical consequences of these trends: higher ambient operating temperatures as facilities relax cooling setpoints to save energy, the need for more efficient cooling strategies overall, and the rapid voltage sag and spike behaviour that AI-driven compute loads introduce as they cycle between idle and peak. Where legacy chemistries were designed around stable, predictable draw, CSB engineered toward volatility as the new baseline.

That forward positioning extends beyond a single product line. CSB maintains a lithium-ion option alongside its VRLA portfolio for customers whose workloads favor a longer cycling footprint, while continuing to serve enterprise and edge deployments where VRLA's cost and simplicity remain the better fit. Rather than betting the strategy on one chemistry winning outright, CSB positions its portfolio to serve hyperscale, enterprise, and edge scenarios simultaneously, a hedge that matters given how unevenly these segments are growing across the region.

The scale of the shift underway is not in question. Global capital investment into data center infrastructure has climbed sharply in recent years and is projected to continue accelerating well into the next decade, driven largely by the same AI and hyperscale expansion that shaped CSB's engineering roadmap. That

trajectory reinforces the value of anticipating structural change rather than retrofitting products once it has already arrived.

Leadership Focus & Growth Strategy Excellence

With nearly four decades in the battery business, CSB Energy Technology firmly believes that trust compounds faster than any single product feature. The company positions itself as a source of truth for OEMs and end users alike, which sometimes means telling a customer that a particular chemistry or configuration is not the right fit for their application, even when a sale is on the table. That candour runs counter to the instinct most vendors have to push whatever is in stock, but it is precisely what has kept CSB's relationships intact across market cycles where competitors have come and gone.

Internally, the company distils this into a simple discipline its sales team is trained to follow: start with what. Before recommending a chemistry, CSB works to understand what the customer actually needs the battery to do, rather than leading with a product pitch. In a market crowded with new chemistries each claiming to solve every problem, that diagnostic step separates genuine fit from marketing noise, and it reframes growth as something earned through repeat trust rather than manufactured through volume.

That philosophy shows up in how CSB positions itself between two competing technologies. Conventional VRLA increasingly struggles to meet modern performance demands, while lithium-ion introduces higher upfront cost and added system complexity. CSB has built its leadership position in the space between them, enhancing VRLA capability to close the performance gap while preserving the simplicity and cost profile that make it the practical choice for a large share of data center operators.

The growth strategy that follows is deliberately unhurried. Rather than chasing transaction volume, CSB is building long-lasting partnerships aimed at residual growth, betting that customers who see the company as a stable, honest partner will keep returning and expanding scope over time. That approach requires resisting the temptation to oversell a new chemistry simply because it is novel, a discipline CSB applies consistently even when it costs a short-term sale. It is a slower path to growth, but one built to compound

Continuous Engineering as Competitive Advantage

Lead-acid chemistry has been around for roughly a century and a half, which makes it easy to assume there is little left to engineer. CSB Energy Technology's work on Calor XHT argues otherwise. At the center of the design is a catalyst introduced at each battery vent that dramatically improves hydrogen recombination, the process by which a valve-regulated lead-acid battery converts expelled hydrogen back into water to stay internally hydrated. Without it, batteries dry out over time, and heat accelerates that failure: the long-standing rule of thumb in the industry holds that battery life halves for every 10 degrees Celsius above 25, meaning a ten-year design life can shrink to five years at 35 degrees. The catalyst is engineered specifically to break that curve, keeping the battery hydrated and operating normally well into territory that would otherwise shorten its service life.

The catalyst does not work alone. An advanced AGM separator design guards against dendrite growth and internal shorting, electrolyte and specific-gravity adjustments stabilize performance at elevated temperatures, and structural changes to the case and jar were made to withstand high-rate discharge

under sustained thermal stress. CSB also redesigned the power take-offs at the battery's front terminals, allowing higher amperage throughput and greater kilowatt discharge capacity. Individually, each change is incremental. Combined within a single, familiar VRLA architecture, one that customers and integrators already know how to specify and install, they add up to a battery that behaves differently under conditions that would degrade a conventional one, without asking anyone to relearn how to work with it.

This engineering effort sits inside a broader, ongoing technology roadmap rather than a one-time launch. CSB is evaluating next-generation lithium-ion chemistry variants, many originally developed for electric vehicle applications and now migrating into stationary storage as EV volumes have underdelivered relative to expectations, freeing up cell technology that had nowhere else to go until AI-driven demand created a new outlet. In parallel, the company is tracking bipolar lead-acid technology, which eliminates the lead substrate inside the battery and could improve both cycle life and power density. Alongside this forward-looking work, CSB continues refining yield and throughput on its legacy platforms, tightening plate construction and assembly processes to keep pace with rising demand. Technology leverage, in CSB's approach, functions less as a single achievement to point to and more as a continuous discipline applied across both current products and whatever comes next.

Product/Service Value: The Economics of Reliability

Value in the battery business is easy to claim and hard to prove, which is why CSB Energy Technology anchors its case in a specific number: an eight-year warranty on Calor XHT at standard operating temperature, up from roughly five years on legacy VRLA platforms. That extension narrows the total-cost-of-ownership gap with lithium-ion, typically warrantied around ten years, while preserving VRLA's lower upfront cost and operational simplicity. It is not a marginal improvement dressed up as a breakthrough; it materially changes the replacement math a data center operator must run.

What separates this claim from a data sheet promise is where it has been tested. Rather than relying solely on lab simulations of temperature and load, CSB points to a deployment in which the battery held its charge through actual voltage sags and spikes under sustained heat, the kind of real-world variability that lab chambers approximate but never fully replicate. Performance data earns attention; performance that survives contact with an uncontrolled environment earns trust, and CSB treats that distinction as central to how it demonstrates value rather than simply asserts it.

The economic case compounds from there. Fewer replacement cycles mean lower operating expenditure over the life of a deployment, and because each unit lasts longer, operators can also reduce the number of batteries they need to hold in reserve across a site, a footprint reduction that becomes a genuine multiplier once applied across a customer's full portfolio of locations. Set against the alternatives, the trade-offs are clear: conventional VRLA underperforms once temperatures climb, while lithium-ion solves that problem but arrives with a higher purchase price and added system complexity. Calor XHT is positioned deliberately in the space between, offering extended service life and warranty confidence without asking customers to absorb lithium-ion's cost or complexity penalty, a balance that lets operators optimize performance and cost together rather than trading one for the other.

Operational Efficiency: Giving Operators Control Over Their Own Service Life

Ask a facility operator what operational efficiency means day to day, and the answer rarely starts with a spec sheet. It starts with how much time and labour go into keeping a system running without incident. CSB Energy Technology's higher ambient-temperature tolerance changes that calculation at the infrastructure level: facilities running Calor XHT can relax cooling setpoints without shortening battery life, which simplifies HVAC design and reduces how hard cooling systems must work to protect equipment that no longer needs the same tight thermal margins.

The replacement math tells a similar story from a different angle. Legacy VRLA batteries typically require replacement roughly every five years against lithium-ion's ten, a two-to-one difference that translates directly into more frequent site visits, more labour, and more disruption to mission-critical operations. Calor XHT extends that VRLA interval to eight years, closing the gap to something closer to one-to-one and meaningfully reducing how often operators must plan around a replacement cycle at all.

That interval is not fixed; it is a lever operators can pull themselves. CSB's warranty structure ties duration directly to operating temperature, eight years at 25 degrees Celsius against five years at 35, which means facilities that hold to standard operating conditions get the longest service life and the least frequent maintenance disruption, while those pushing warmer setpoints for energy savings trade some of that interval back. Either way, the choice sits with the operator rather than being dictated by the battery.

Underpinning both of these customer-facing efficiencies is work CSB does internally that rarely gets discussed outside the company. Ongoing refinements to yield, throughput, and plate construction on its legacy manufacturing lines allow CSB to keep pace with rising demand without sacrificing build quality, a discipline that ultimately supports the reliability operators depend on once a battery is installed and running.

Customer Experience: Trust Tested by Time

For CSB Energy Technology, customer experience is not a support function that begins after a sale closes. It starts at the design table. Customers who provide input during product development get visibility into

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how their batteries are actually built, are walked through onboarding and commissioning, have access to technical support once systems are live, and are guided through end-of-life disposal when a battery finally reaches the end of its service life. That arc from design through disposal is treated as a single continuous relationship rather than a series of separate transactions handled by different teams, and CSB is explicit that it does not want to simply build a battery and move on.

Atlantic Battery illustrates what that relationship looks like in practice. As one of CSB's launch customers, Atlantic contributed direct input and feedback into early product development, shaping decisions before a product ever reached the broader market. That kind of collaboration is

harder to manufacture after the fact than to build in from the start, and it gives CSB a genuine, attributable reference point rather than a generic customer-satisfaction claim. Feedback loops like this are not incidental either; CSB runs structured voice-of-customer surveys that feed directly back into product development, reinforcing a self-image the company describes internally as a single source of truth, part advisor and part manufacturer, for the clients it serves. That framing shows up consistently across how CSB talks about its own role, not just in marketing language but in the day-to-day decisions its team makes with customers.

Continuity matters as much as any individual touchpoint. Roughly forty years in mission-critical applications means CSB has supported customers across full equipment lifecycles many times over, not as a one-off engagement but as a pattern that repeats across sites and years. That track record does not replace responsiveness on any single issue, but it does mean customers are working with a partner whose presence, from initial design conversation to final disposal guidance, has already been tested by time rather than promised in advance.

Conclusion

CSB Energy Technology's best practices excellence rests on a rare alignment: a company that identified a precise gap in how data centers were evolving, then built the engineering, the economics, and the customer relationships needed to close it, all pointing the same direction. Calor XHT is not an isolated product win. It is the physical expression of forty years of trust built through candour rather than persuasion, of an R&D discipline that treats a century-old chemistry as unfinished work, and of a warranty structure that hands operators real control over their own operating costs. Each strength sharpens the next: engineering depth gives the value proposition teeth, value gives the growth strategy substance, and a customer relationship built from the design table onward gives all of it staying power. In a market where AI-driven demand is reshaping power and thermal requirements faster than most vendors can respond, CSB has already built the answer and proven it in the field, not just on paper. That combination of foresight, technical rigor, and earned trust is what sets CSB apart, and what makes this recognition warranted.

With its strong overall performance, CSB Energy Technology earns Frost & Sullivan's 2026 Asia Pacific Company of the Year Recognition in the Data Center Battery Systems industry.

What You Need to Know about the Company of the Year Recognition

Frost & Sullivan's Company of the Year Recognition is its top honor and recognizes the market participant that exemplifies visionary innovation, market-leading performance, and unmatched customer care.

Best Practices Recognition Analysis

For the Company of the Year Recognition, Frost & Sullivan analysts independently evaluated the criteria listed below.

Visionary Innovation & Performance

Addressing Unmet Needs: Customers' unmet or under-served needs are unearthed and addressed to create growth opportunities across the entire value chain

Visionary Scenarios Through Megatrends: Long-range scenarios are incorporated into the innovation strategy by leveraging megatrends and cutting-edge technologies, thereby accelerating the transformational growth journey

Leadership Focus: The company focuses on building a leadership position in core markets to create stiff barriers to entry for new competitors and enhance its future growth potential

Best Practices Implementation: Best-in-class implementation is characterized by processes, tools, or activities that generate consistent, repeatable, and scalable success

Financial Performance: Strong overall business performance is achieved by striking the optimal balance between investing in revenue growth and maximizing operating margin

Customer Impact

Price/Performance Value: Products or services offer the best ROI and superior value compared to similar market offerings

Customer Purchase Experience: Purchase experience with minimal friction and high transparency assures customers that they are buying the optimal solution to address both their needs and constraints

Customer Ownership Excellence: Products and solutions evolve continuously in sync with the customers' own growth journeys, engendering pride of ownership and enhanced customer experience

Customer Service Experience: Customer service is readily accessible and stress-free, and delivered with high quality, high availability, and fast response time

Brand Equity: Customers perceive the brand positively and exhibit high brand loyalty, which is regularly measured and confirmed through a high Net Promoter Score®

Best Practices Recognition Analytics Methodology

Inspire the World to Support True Leaders

This long-term process spans 12 months, beginning with the prioritization of the sector. It involves a rigorous approach that includes comprehensive scanning and analytics to identify key best practice trends. A dedicated team of analysts, advisors, coaches, and experts collaborates closely, ensuring thorough review and input. The goal is to maximize the company's long-term value by leveraging unique perspectives to support each Best Practice Recognition and identify meaningful transformation and impact.

VALUE IMPACT			
STEP		WHAT	WHY
1	Opportunity Universe	Identify Sectors with the Greatest Impact on the Global Economy	Value to Economic Development
2	Transformational Model	Analyze Strategic Imperatives That Drive Transformation	Understand and Create a Winning Strategy
3	Ecosystem	Map Critical Value Chains	Comprehensive Community that Shapes the Sector
4	Growth Generator	Data Foundation That Provides Decision Support System	Spark Opportunities and Accelerate Decision-making
5	Growth Opportunities	Identify Opportunities Generated by Companies	Drive the Transformation of the Industry
6	Frost Radar	Benchmark Companies on Future Growth Potential	Identify Most Powerful Companies to Action
7	Best Practices	Identify Companies Achieving Best Practices in All Critical Perspectives	Inspire the World
8	Companies to Action	Tell Your Story to the World (BICEP*)	Ecosystem Community Supporting Future Success

*Board of Directors, Investors, Customers, Employees, Partners

About Frost & Sullivan

Frost & Sullivan is the Growth Pipeline Company™. We power our clients to a future shaped by growth. Our Growth Pipeline as a Service™ provides the CEO and the CEO's growth team with a continuous and rigorous platform of growth opportunities, ensuring long-term success. To achieve positive outcomes, our team leverages over 60 years of experience, coaching organizations of all types and sizes across 6 continents with our proven best practices. To power your Growth Pipeline future, visit Frost & Sullivan at <http://www.frost.com>.

The Growth Pipeline Generator™

Frost & Sullivan's proprietary model to systematically create ongoing growth opportunities and strategies for our clients is fueled by the Innovation Generator™.

[Learn more.](#)

Key Impacts:

- **Growth Pipeline:** Continuous Flow of Growth Opportunities
- **Growth Strategies:** Proven Best Practices
- **Innovation Culture:** Optimized Customer Experience
- **ROI & Margin:** Implementation Excellence
- **Transformational Growth:** Industry Leadership



The Innovation Generator™

Our 6 analytical perspectives are crucial in capturing the broadest range of innovative growth opportunities, most of which occur at the points of these perspectives.

Analytical Perspectives:

- **Megatrend (MT)**
- **Business Model (BM)**
- **Technology (TE)**
- **Industries (IN)**
- **Customer (CU)**
- **Geographies (GE)**

