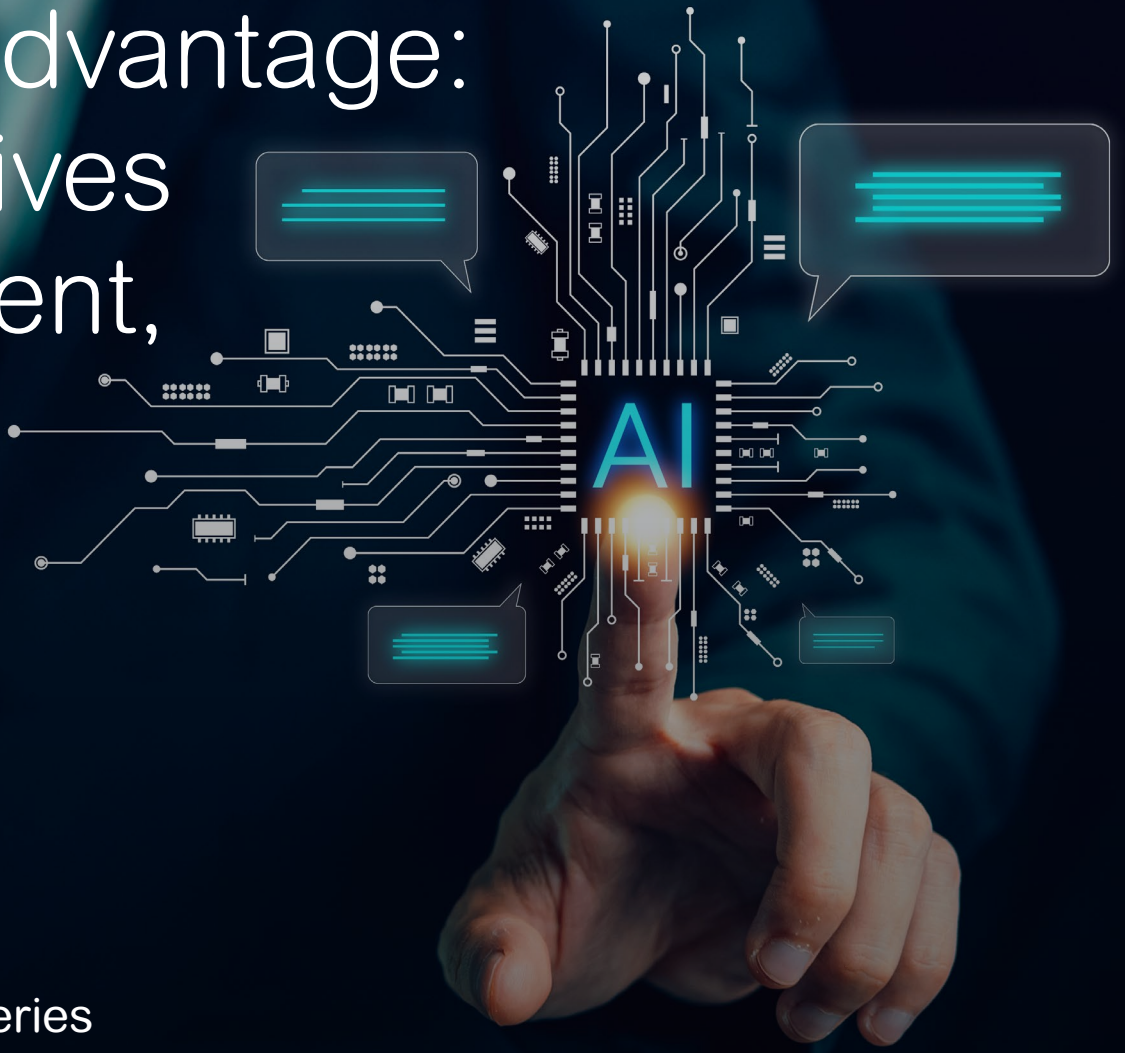
The Infrastructure Advantage: Influencer Perspectives on AI, Secure, Efficient, and Sustainable IT



Data Center & Distributed IT Leadership Series

Life Is On Schneider Electric

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A New Era of Possibility

We are in the midst of a profound transformation. Artificial intelligence, energy innovation, digital infrastructure, and sustainability are converging to redefine how businesses operate and how societies progress. The pace of innovation is relentless, AI adoption is accelerating, regulatory frameworks are evolving, and the demands on IT, energy, data centers, and IT Leaders have never been higher.

This series brings together exclusive interviews with five of the brightest minds in AI, cybersecurity, IT infrastructure, power & cooling, governance and ethics, and sustainability. Their collective insights offer a practical, actionable roadmap for CIOs, CTOs, data center managers, and IT professionals in general navigating this new era. As data center and AI factories, electricity consumption is projected to double within five years[1] and workloads reshape the landscape, the stakes for resilience, security, energy management, and ethical operations have never been greater.

Inside, you will find perspectives from leaders who are not just responding to change, but shaping it, you will discover:

1. How Andrew Ng sees AI transforming enterprise IT, from rapid prototyping to responsible innovation.
2. Brian Beeler's take on the evolving demands of AI workloads and the backbone role of storage and edge.
3. Chuck Brooks' insights on cybersecurity, resilience, and the convergence of digital threats.
4. Kay Firth-Butterfield's guidance on ethics, compliance, and building trust in enterprise AI.

1 IDC Press Release: "Worldwide Spending on Compute and Storage Hardware for AI Deployments Doubled in 2024, Set for Further Growth in 2025" (February 2025).



5. Steven Carlini's perspective on sustainability, energy innovation, and the next chapter for digital infrastructure.

This series is designed to spark new ideas, challenge assumptions, and help you drive meaningful change in your organization. As you explore these insights, we invite you to consider how you can lead with responsibility, resilience, energy efficiency, and sustainability at the core of your business digital strategy.

Let these insights inspire your next steps toward building not just smarter IT infrastructure, but a more sustainable, secure, energy-efficient, and innovative future.

"The demands on IT, energy, data centers, and IT Leaders have never been higher."

Accelerating Enterprise AI:
Insights from Andrew Ng on Building, Upskilling, and Responsible Innovation

As artificial intelligence continues to transform industries, the pressure on IT leaders to deliver scalable, secure, efficient and sustainable infrastructure has never been greater. In this exclusive interview, Andrew Ng, renowned AI pioneer, Managing General Partner at AI Fund, Founder of DeepLearning.AI and LinkedIn Top Voice shares his perspective on how enterprises can accelerate AI adoption, empower their teams, and build resilient digital foundations for the future.



AI's Impact: From Prototyping to Production

Andrew Ng likens AI to electricity, a general-purpose technology driving innovation across every sector. "It's useful for so many things, and it will vary by industry," he explains. "The work ahead for IT professionals is to create a foundation that lets businesses figure out and execute all the valuable things AI can now do," Ng emphasizes that while off-the-shelf solutions have a place, organizations gain the most value by identifying unique opportunities to build or customize AI for their specific needs.

One of the most profound shifts, according to Ng, is the decline in the cost and complexity of prototyping. "The cost of building prototypes has dropped tenfold. What used to take months and a team of engineers can now be done in an afternoon," he says. This rapid iteration enables companies to experiment with multiple ideas, accepting that many will fail, but a few will deliver breakthrough results. "If you can build 20 prototypes and two succeed, that's a great trade-off," Ng notes.



This trend is reflected industry-wide: IDC reports that organizations increased spending on compute and storage hardware for AI deployments by 97% year-over-year in early 2025, illustrating the surge in infrastructure investment for AI workloads.[2]

Empowering Teams: Training, Sandboxes, and Permissionless Innovation

With AI's potential unlocked by experimentation, Ng urges organizations to invest in both technical upskilling and cultural change. "Training is a large part of it, giving teams context about what AI can and cannot do, and ensuring they have the skills to execute on project ideas," he says. He advocates for a "permissionless innovation" approach, where sandbox environments allow teams to experiment safely without bureaucratic delays. "Within these constraints, teams can just run like crazy and build tons of prototypes," Ng explains.

This philosophy aligns with the growing enterprise focus on upskilling: by 2025, 39% of organizations will be in the "experimentation" stage of AI adoption, with 14% moving into the "expansion" stage, according to Gartner.[3] Ng stresses that learning to code—and, increasingly, to prompt AI systems—is becoming table stakes for many knowledge workers, not just developers.

2 IDC Press Release: "Worldwide Spending on Compute and Storage Hardware for AI Deployments Doubled in 2024, Set for Further Growth in 2025" (February 2025).

3 Gartner: "AI Adoption Trends and Benchmarks 2024–2025" (March 2024).

Cloud, On-Prem, or Hybrid? Strategic Choices for AI Infrastructure

When asked whether enterprises should build AI infrastructure in the cloud or on-premises, Ng points to a pragmatic mix. “I see a lot of work on-prem, a lot of cloud, and a lot of hybrid architectures,” he says. Factors like privacy, latency, and regulatory requirements all play a role, but Ng highlights an often-overlooked benefit: “Large cloud companies tend to use much more renewable energy and run more efficiently than most legacy on-prem implementations.”

U.S. data center energy use accounted for approximately 4% of total U.S. electricity consumption in 2023 and is projected to rise to 7–12% by 2025, primarily due to the growth of AI and cloud services.[4] As workloads scale, organizations must balance sustainability, performance, and compliance.

Responsible AI: Moving Fast, But Not Breaking Things

Ng is clear that speed must be matched by responsibility. “In Silicon Valley, ‘move fast and break things’ got a bad reputation. The right mantra is ‘move fast and be responsible,” he says. He recommends deploying new AI applications in protected environments, such as internal sandboxes or limited-access pilots—before scaling them to production. This approach allows for rapid iteration and learning while protecting sensitive data and brand reputation.

Deploying new AI applications safely starts with setting up secure, isolated environments where teams can experiment without risking sensitive business data or live operations. These environments should be centrally governed, with standardized templates and controls to ensure

4 Fortune: “AI and Data Centers Could Use 7–12% of U.S. Electricity by 2025” (February 2025).





compliance and security from the outset. Activity and results should be logged and tracked in real-time, making it easy to monitor progress and evaluate outcomes against business objectives.

Once initial testing is complete, promising solutions can move into limited-access pilots, where a small group of users test the application in real-world conditions. Here, data privacy can be further protected through masking and anonymization, while ongoing monitoring helps identify and address any security or operational issues before wider rollout. By connecting these environments to broader organizational metrics and workflows, it becomes straightforward to escalate successful pilots into production, ensuring that innovation is both rapid and responsible.

Of course, building a responsible and innovative AI culture isn't just about technology and process—it also depends on people. Ng also underscores the importance of continuous learning: "For developers, taking short or long courses regularly to stay up with rapidly emerging AI trends is important. For non-technical staff, learning how to use AI to write code or prompt systems will be the next layer up."

The Future: Democratizing AI and Building Resilient Teams

Looking ahead, Ng sees a future where AI fluency is as fundamental as web search skills. "I can't imagine hiring a marketer, recruiter, or lawyer who doesn't at least know how to prompt an LLM,[5]" he says. "Many teams are approaching the point where knowing how to code will be expected in non-engineering roles."

He urges organizations to "build, build, build"—empowering every employee to experiment, learn, and contribute to AI-driven transformation.

5 Large Language Model https://knowledge-centre-translation-interpretation.ec.europa.eu/en/news/what-large-language-model

"AI technology has made it much easier to build very powerful applications that just weren't possible a few years ago. The challenge is to create the environment and training so everyone can participate responsibly."

Key Takeaways for CIOs and Data Center Leaders

Accelerate Experimentation: Lower prototyping costs and AI-assisted development mean organizations can rapidly test and iterate on new ideas. Empower teams to build and validate multiple prototypes in safe, sandboxed environments.

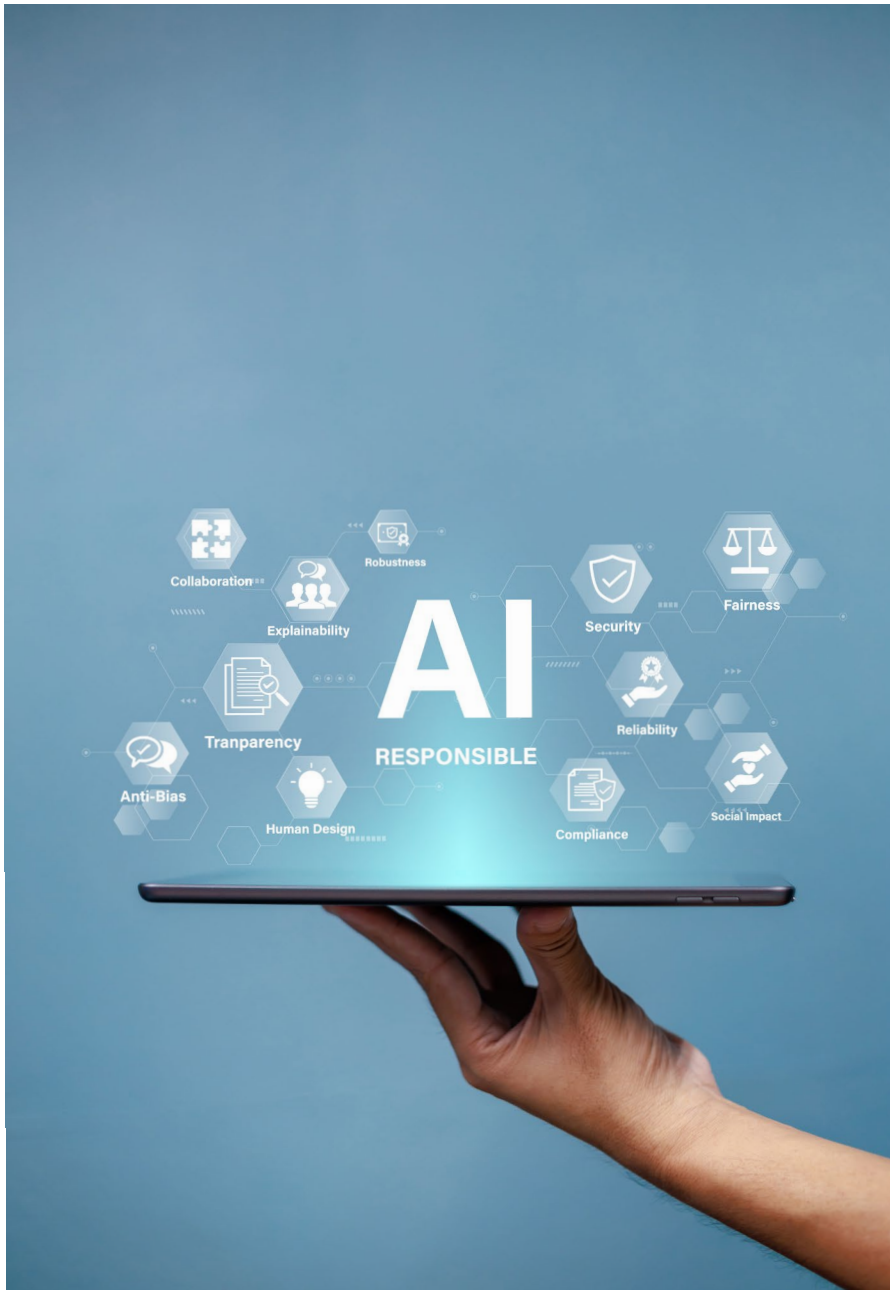
Invest in Upskilling: Coding and AI prompting are becoming essential skills for both technical and non-technical staff. Develop ongoing training programs to ensure your workforce can leverage AI tools effectively.

Balance Cloud and On-Prem Strategies: Consider hybrid architectures for flexibility, performance, and compliance. Moving workloads to the cloud can also support sustainability goals, as leading providers increasingly rely on renewable energy.

Foster Permissionless Innovation: Remove unnecessary barriers to experimentation. Create clear guidelines and protected environments so teams can innovate without bureaucratic delays while still safeguarding sensitive data.

Move Fast—Responsibly: Adopt a "move fast and be responsible" mindset. Pilot new AI applications internally before scaling and regularly review security, privacy, and compliance frameworks as technology evolves.

Prepare for a New Baseline: As AI becomes ubiquitous, fluency in AI-driven tools and workflows will be as fundamental as web search skills. Equip your teams now to stay competitive and resilient.



Navigating AI Demands:
Insights on IT Infrastructure from Brian Beeler

The AI revolution is reshaping industries and redefining the role of IT infrastructure. As CIOs and data center leaders grapple with the increasing demands of AI-driven workloads, the need for robust, efficient, and scalable IT infrastructure has never been more critical. Brian Beeler, Editor-in-Chief of StorageReview, shares his insights on these challenges and opportunities during an exclusive interview. His expertise sheds light on the evolving IT infrastructure landscape and its pivotal role in enabling enterprise AI transformation.



The Growing Demands of AI on IT Infrastructure

AI has become a cornerstone of enterprise IT strategies, but it comes with significant demands on IT infrastructure. Beeler emphasized the transformative yet challenging nature of AI acceleration, stating, “AI investments are going to be one of the most expensive investments in your data center. Whether it’s a $30,000 edge card in one server or millions of dollars worth of GPUs that are networked together, fueling that investment is the only way to make it work.”

The challenge lies not only in acquiring cutting-edge hardware but also in ensuring that the infrastructure can support AI workloads effectively. “Power consumption, cooling, networking demands, and storage fabrics are all being pushed to their limits,” Beeler noted. This is particularly evident in the need for GPUs to be fed with data at unprecedented speeds. “Getting data nearest to the GPUs as fast as you can is going to be a perpetual challenge,” he added.

With AI driving a 40.5% CAGR in global data center capacity through 2027[6] and electricity consumption expected to double to 857 TWh between 2023 and 2027[7] , the pressure on data centers to evolve is immense.

Storage Infrastructure: The Backbone of AI

Storage infrastructure is a critical foundation for supporting the explosive growth of AI workloads. According to IDC, the global datasphere is expected to surpass 291 zettabytes by 2027, with AI workloads driving a significant portion of this growth.[8]

This surge in data is prompting data center operators worldwide to expand and modernize their storage systems, ensuring they can keep pace with the demands of AI and advanced analytics. The impact of this trend extends well beyond storage arrays—there are ripple effects across the entire data center ecosystem. To maintain reliable, efficient, and scalable operations, organizations are also investing in high-density racks, robust UPS systems, advanced liquid and immersion cooling, intelligent PDUs for real-time power management, and next-generation DCIM platforms that deliver holistic infrastructure monitoring, automated sustainability reporting, and compliance with evolving regulations.

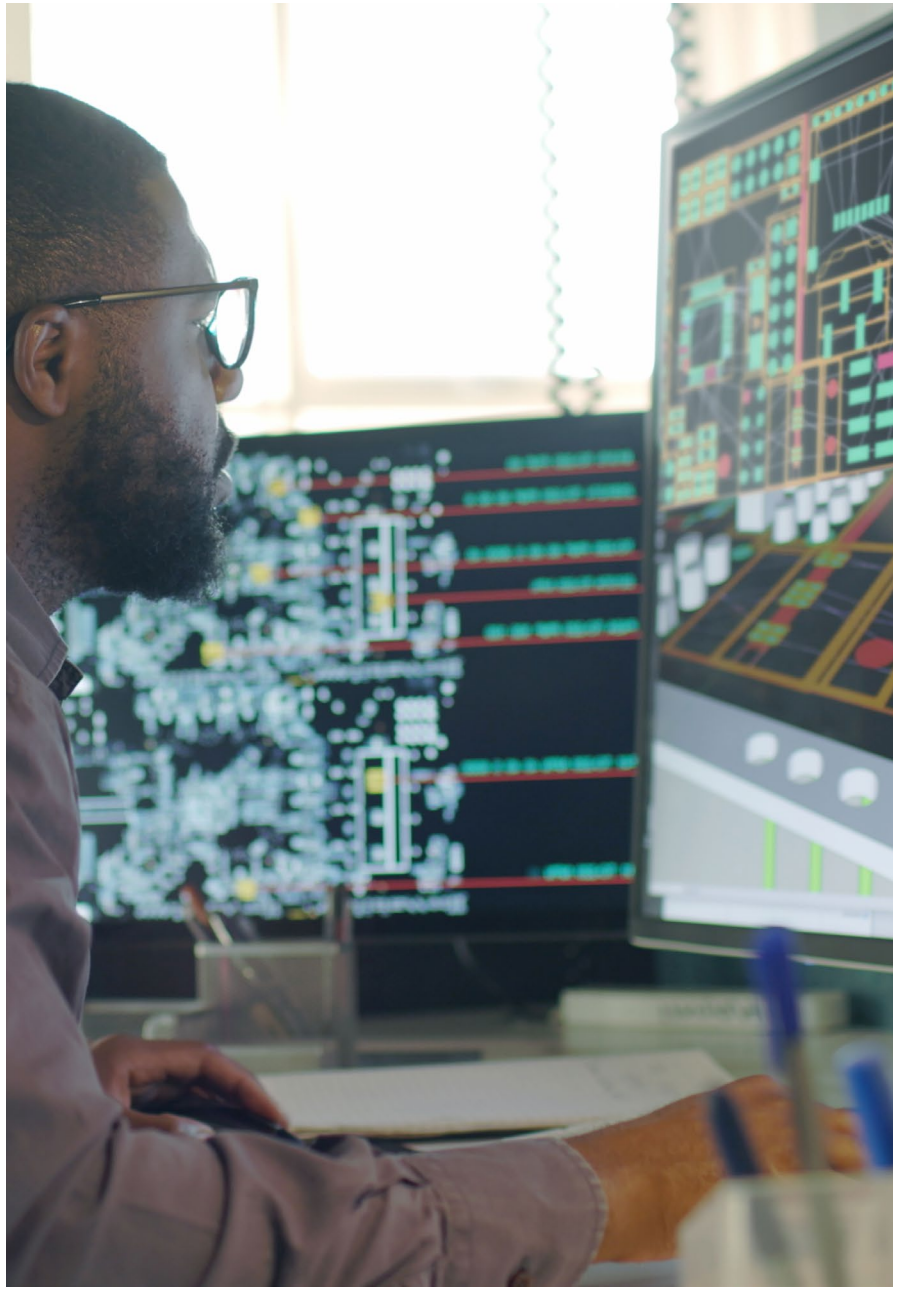
As Brian Beeler notes, “The server that those GPUs are in typically doesn’t offer a whole lot of storage, so the storage has to come from somewhere else.” As organizations scale up their AI initiatives, supporting infrastructure—from racks and PDUs to UPS and cooling—must evolve in tandem to ensure resilient, high-performance operations.



6 Worldwide Spending on AI-Centric Systems Forecast to Reach $154 Billion in 2023, According to IDC.

7 Global Energy Consumption by Source. Our World in Data, https://ourworldindata.org/energy-production-consumption. .

8 IDC Global DataSphere Forecast, 2024.



This often involves leveraging advanced technologies like GPU Direct Storage and NVMe over Fabrics to bring data closer to GPUs. Beeler emphasized the significance of these modern storage solutions, explaining, “We’re looking at faster interconnects and technologies that bring data as close as it can be to the GPU to improve utilization.” Yet, he also acknowledged the practical hurdles: “Storage people are very conservative, and there’s still some apprehension in adopting technologies like NVMe over Fabrics.” Overcoming this reluctance will be key as data centers strive to meet the demands of AI-driven workloads and unlock new levels of efficiency and performance.

The Role of Edge Computing in AI Workloads

Edge computing is emerging as a crucial component of IT infrastructure in managing the massive data volumes generated by AI applications. Beeler shared compelling examples of how edge computing is transforming industries. “Edge is going to create a lot of data,” he said, citing use cases such as video management applications, smart cities, and industrial automation.

One particularly intriguing example involved smart cameras for high school sports. “You can set it up after it sees everybody playing and say, ‘Give me a highlight reel for number 14.’ These cameras, combined with a little bit of storage and some AI, are transforming how recruiting happens for college and professional sports,” Beeler explained. This underscores the importance of analytics at the edge to process data locally and send only actionable insights back to the core data center. With edge computing expected to grow by 36-38% globally[9], its role in enabling real-time processing and reducing latency is becoming indispensable.

9 Fortune business insights Edge computing market

Hybrid Multi-Cloud Architectures: Balancing Flexibility and Cost

As enterprises adopt hybrid multi-cloud architectures, the need for adaptable and secure storage solutions becomes paramount. Beeler noted that many organizations are starting their AI journeys in the cloud before transitioning to on-premises environments for production workloads. “The cloud makes it easy to stand up some workloads, but it’s expensive to continue running them at full steam,” he said.

Cost considerations and the need for greater control over data drive the shift from cloud to on-premises. “At scale, the cloud model is more expensive than investing in on-premises hardware,” Beeler pointed out. However, he cautioned that on-premises deployments require significant investments in modernizing infrastructure, particularly in areas like networking and storage.

Energy Efficiency and Sustainability in IT Infrastructure

Innovations in cooling technology are pivotal in improving energy efficiency and reducing the environmental footprint of data centers. Beeler highlighted the adoption of liquid cooling and immersion cooling solutions, which require building the appropriate cooling architecture to combine the best of air and liquid solutions, reducing energy consumption and carbon footprint from the high compute demands.

Recent advancements in cooling technology are transforming how data centers manage energy efficiency and address the growing heat loads driven by AI workloads. Liquid cooling systems like direct-to-chip and immersion cooling are emerging as game-changing solutions. These technologies improve heat dissipation, enable higher server density, and offer significant energy efficiency compared to traditional air cooling





methods. Innovative liquid and air cooling architecture solutions are specifically designed to handle the intense thermal demands of AI-driven data centers, ensuring sustainable operations while maintaining peak performance.

In addition to liquid cooling, creative strategies like heat reuse are gaining traction across the industry. Data centers are increasingly repurposing excess heat for community use, such as heating residential buildings and swimming pools or supporting agricultural initiatives like growing plants[10]. These practices align with broader sustainability goals, reducing energy waste and fostering community goodwill. They also help data centers comply with strict environmental regulations in regions like Europe and California, where policies prioritize low-carbon and energy-efficient operations.

10 Data Center Knowledge – Data Center Cooling Trends and Strategies to Watch in 2025.

As the adoption of liquid cooling and heat reuse strategies accelerates, the data center industry is setting a new standard for sustainability. According to IDC analyst Sean Graham, 22% of data centers already utilize liquid cooling systems, and this number is expected to grow as operators explore advanced cooling fluids and technologies tailored to AI-driven workloads[11]. These innovations not only reduce the environmental footprint of data centers but also position them as leaders in sustainable business practices.

The Importance of a Clear AI Strategy

A recurring theme in Beeler's insights was the importance of having a clear AI strategy. "The first question should always be, 'What's the goal?'" he said. Whether it's increasing sales, improving operational efficiency, or enhancing customer experiences, defining the objectives is crucial for determining the right infrastructure investments.

Beeler also highlighted the need for collaboration between IT and AI teams to ensure successful outcomes. "It's about asking the right questions, understanding what you want, and staying current on trends," he said. This requires a commitment to ongoing education and cross-functional communication within the organization.

Paving the Way for Sustainable and Resilient IT Infrastructure

Brian Beeler's insights offer a comprehensive view of the challenges and opportunities in IT infrastructure as enterprises embrace AI. From the critical role of storage and edge computing to the importance of energy efficiency and the myth of future-proofing, his perspectives provide

11 Data centers warm up to liquid cooling, Networkworld, 2024

valuable guidance for CIOs and data center managers navigating this transformative era. As Beeler fittingly puts it, “AI is not a monolithic thing. It’s about understanding your objectives, asking the right questions, and staying adaptable.” By focusing on these principles, organizations can position themselves to harness AI’s full potential while building resilient and sustainable IT infrastructures.

Key Takeaways for CIOs and Data Center Leaders

Prepare for Exponential Data Growth: AI workloads are driving unprecedented growth in data volume and storage needs. Future-proof your infrastructure by investing in scalable storage, high-density racks, advanced PDUs, UPS systems, and efficient cooling solutions to support evolving demands.

Prioritize Infrastructure Ecosystem Integration: Modern AI factories require more than just servers. Holistic solutions—including DCIM platforms, racks, power distribution, cooling, and monitoring—are essential for ensuring resilience, efficiency, and visibility across your entire operation.

Accelerate Adoption of Advanced Technologies: Embrace innovations such as direct-to-chip and immersion liquid cooling, GPU Direct Storage, and NVMe over Fabrics to optimize performance, reduce energy consumption, and improve server density. Stay open to new technologies to maintain a competitive edge.

Balance Sustainability with Performance: Hybrid IT infrastructures are under regulatory and societal pressure to minimize environmental impact, adopt energy-efficient practices and tools to monitor and reduce power usage. Explore creative strategies like heat reuse and align operations with frameworks such as the EU Energy Efficiency Directive (EED).

Foster a Culture of Continuous Improvement: Encourage cross-functional collaboration between IT, facilities, and sustainability teams. Regularly review infrastructure, upskill staff, and stay informed about industry trends to ensure your organization remains agile and resilient in the face of rapid AI-driven change.

Act Now to Stay Ahead: The pace of AI innovation means waiting is not an option. Start modernizing your infrastructure today to support current business needs and position your organization for long-term success in the age of AI.



Defending the Digital Frontier:
AI, Cybersecurity, and Data Center Resilience Insights from Chuck Brooks

In today's hyperconnected world, organizations are rethinking risk, resilience, and trust as artificial intelligence, cybersecurity, and data center infrastructure rapidly converge. The pace of digital innovation is relentless, bringing both fresh opportunities and new complexities for leaders managing critical IT environments. In this exclusive interview, Chuck Brooks, a globally recognized cybersecurity authority, Forbes contributor, LinkedIn's Top Tech Person to follow and author of Inside Cyber, offers his perspective on the fast-changing threat landscape.



The Accelerating Threat Landscape: AI as Both Weapon and Shield

Artificial intelligence has long played a role in cybersecurity, but Brooks notes that recent advances, especially in generative AI, have fundamentally transformed the threat environment. "AI has changed everything," he says. Attackers now use AI to automate and scale phishing campaigns, generate polymorphic malware and ransomware, and create deepfakes that have already been used to impersonate executives and authorize fraudulent financial transfers. The result? Even less-skilled threat actors can now launch convincing, high-impact attacks.

AI-powered bots are also mimicking human behavior, making distributed denial-of-service (DDoS) attacks and social engineering attempts much harder to spot and stop. Brooks explains, "Attackers are using AI for reconnaissance, to create more sophisticated malware, and to automate attacks at scale." Social media and organizational data are being mined to craft highly personalized lures, targeting employees with messages that appear authentic and urgent.

The scale of the threat is underscored by recent research: the use of stolen credentials to access valid accounts surged by 71% last year[12], and credential harvesting was the top impact in 28% of incidents, according to IBM's X-Force Threat Intelligence Index 2024.[13]

With attackers growing more sophisticated and breaches becoming more frequent, the financial stakes for organizations are higher than ever. The cost of outages is rising, according to the Uptime Institute's 2024 survey, 20% of significant data center outages now cost over $1 million, 33% fall between $100,000 and $1 million, and 46% are under $100,000.[14] As Brooks points out, these incidents can no longer be seen as minor technical issues or simple compliance costs, with today's sophisticated attacks, "it's millions of cost and it's operations." In short, outages and breaches are business-critical events with real financial consequences.

Modern Defense: AI-Driven Security, Zero Trust, and Proactive Detection

To keep pace with these evolving threats, Brooks recommends that organizations take a fresh look at how they approach security. "It's now AI versus AI. Humans alone can't keep up," emphasizing just how quickly the landscape is changing. Relying on old, reactive methods simply isn't enough anymore. Instead, he suggests embracing smarter, more proactive strategies like using AI to spot unusual behavior and detect threats early before they have a chance to cause real harm. By layering in these advanced tools, security teams can cut through the noise, focus on what truly matters, and respond to risks before they escalate. Zero trust architecture, Brooks says, should be a cornerstone of modern cybersecurity. "You have to know and verify everything connected to your network, devices, users, privileges and segment your data to limit

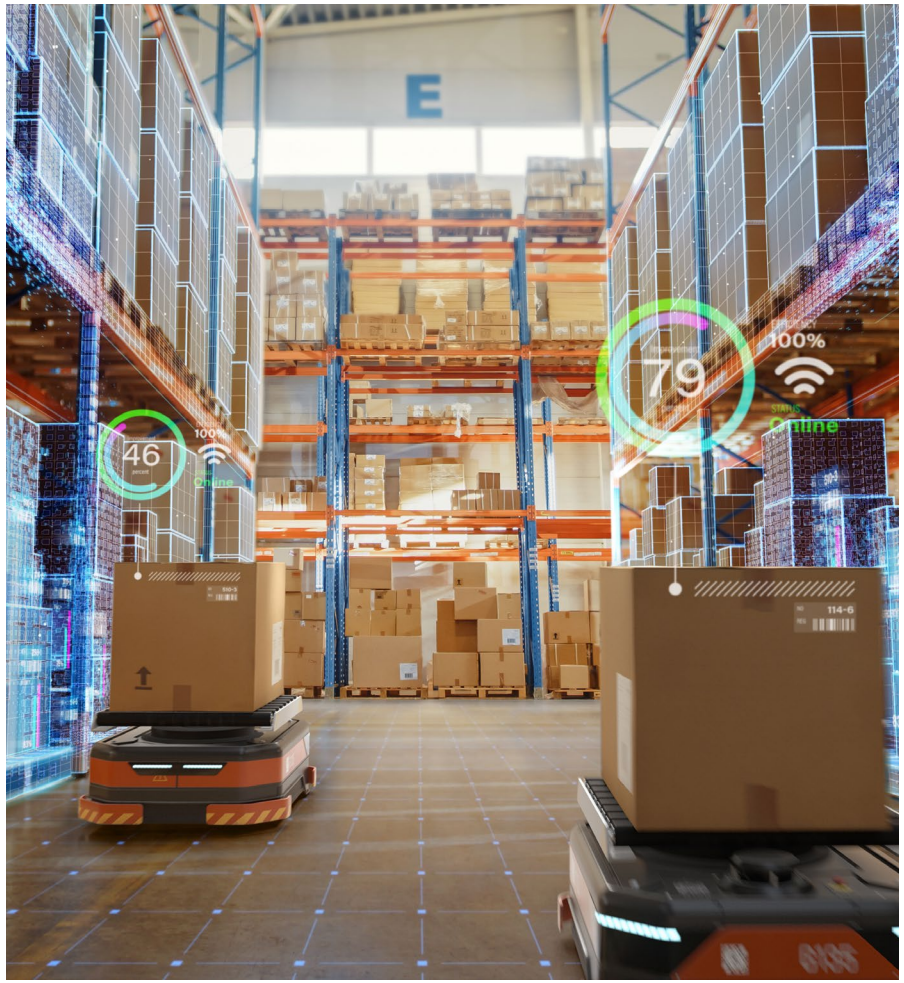


exposure." Strong identity and access management, data segmentation, and multi-factor authentication are now critical, especially across hybrid, edge, and multi-cloud IT environments.

He points out that Extended Detection and Response (XDR) platforms can unify threat intelligence across diverse systems, enabling security teams to respond swiftly and effectively. Yet the resource gap remains real. Many small and medium-sized enterprises lack the budget or expertise to match those of highly organized, well-funded adversaries. Supply chain vulnerabilities are also a persistent concern, as attackers often target weaker vendors to get to larger organizations. Rigorous vetting and monitoring of partners are now essential.

12 IBM X-Force Threat Intelligence Index 2024
13 IBM X-Force 2025 Threat Intelligence Index
14 Uptime Institute Global Data Center Survey 2024

In addition to these strategies, Brooks highlights the need for continuous monitoring and auditing of all devices, “You have to really look at this in a patching way… and that it’s continually patched in the right way.” He stresses that security is not just about the perimeter, but also about maintaining up-to-date firmware and ensuring all solutions and devices, like DCIM platforms, meet industry security standards.



Enabling Innovation Without Compromising Security

As organizations accelerate their adoption of AI and Digital Transformation (DX), Brooks is adamant that innovation and security must go hand in hand. “Give teams the ability to experiment in sandboxed environments, but keep sensitive data isolated and access tightly controlled.” He warns that open systems are particularly at risk of data poisoning and bias. “Before moving anything to production, organizations must harden their AI models, enforce multi-factor authentication, and audit regularly for weaknesses.”

Continuous monitoring for anomalies, rigorous vetting of third-party components, and regular security audits are vital to prevent vulnerabilities. By prioritizing security at every stage, organizations can harness the power of AI to minimize risk.

Complexity, Visibility, and the Expanding Attack Surface

Modern IT environments have become ever more complex, spanning on-premises infrastructure, cloud, edge computing, and legacy systems. This complexity introduces new blind spots and expands the attack surface. “Visibility is the number one issue,” Brooks says. “Without unified oversight, you can’t spot gaps or respond quickly to threats.”

He recommends unified, centralized security management, robust identity and access controls, and encryption of data at rest and in motion. Physical security should not be overlooked, “Security isn’t just a software issue. Physical and cyber must be unified. Multi-layered perimeters, surveillance, biometrics, and strong network segmentation are all critical.” Security by design, resilience, energy efficiency, and sustainability is essential for new data centers.



Building a Culture of Security and Resilience

Brooks is clear, cybersecurity is no longer just a technical issue, it's central to an organization's ability to operate and adapt in a volatile digital world. As he puts it, "Cybersecurity can't be an afterthought or just a compliance checkbox. It must be a board-level priority, with robust data governance, continuous monitoring, and constant innovation."

True resilience starts with leadership commitment but extends throughout the organization. Security should be part of every decision, from IT operations to business continuity planning and vendor relationships. This cross-functional approach ensures everyone, from the boardroom to the front lines, understands their role in protecting the enterprise.

Brooks also emphasizes the need for unified visibility across increasingly complex and distributed IT environments. "You can't protect what you can't see." Centralized monitoring, automated alerting, and clear reporting allow teams to spot anomalies and respond quickly. Regular risk assessments, scenario planning, and ongoing training keep organizations on top of evolving threats.

Automation and orchestration are crucial for streamlining detection, response, and remediation, especially as infrastructure becomes more complex. By making continuous improvement part of the culture, organizations can move beyond minimum standards while learning from incidents and proactively strengthening their defences.

Embedding these practices into day-to-day operations helps enterprises build IT infrastructures that are not only secure but also agile and capable of withstanding today's threats and tomorrow's unknowns.

Governance, Regulation, and the Global Challenge

Brooks acknowledges the challenge of keeping pace with regulatory demands and the global nature of cyber threats. The rapid proliferation of AI has outpaced the development of governance frameworks. “It’s hard to corral so many different actors, but frameworks like GDPR show it’s possible to set international standards.” He calls for proactive, unified efforts among governments, industry, and academia to establish effective guardrails, share threat intelligence, and keep up with advances in AI and quantum computing.

As the digital landscape continues to evolve, the challenges facing CIOs and data center leaders will only grow more complex. Brooks makes it clear: building a secure and resilient IT foundation is not a one-time project, it’s an ongoing commitment that requires leadership, vigilance, and adaptability at every level.

By embedding security into the heart of IT strategy, fostering a culture of continuous improvement, and being proactive, organizations can navigate uncertainty with confidence. The pace of change is not slowing down, but those who prioritize resilience and readiness today will be best positioned to thrive, no matter what the future holds.

Key Takeaways for CIOs and Data Center Leaders

Here are Chuck Brooks’ top practical actions for IT and infrastructure leaders navigating today’s evolving digital landscape:

Staying Ahead of Advanced Threats: Invest in AI-driven security tools to detect behavioral anomalies and respond to evolving cyberattacks.

Enforcing Zero Trust & Application Security: Implement Zero Trust architecture, ensure all applications and connected devices are certified and updated, and segment/encrypt critical data.

Centralizing Visibility & Control: Use unified management platforms to monitor both cyber and physical assets, and conduct regular audits for compliance and resilience.

Securing the IT Supply Chain: Rigorously vet third-party partners and continuously monitor for vulnerabilities across the supply chain.

Building a Culture of Continuous Vigilance: Make cybersecurity a board-level priority, foster ongoing education, and embed security into every business process.



Navigating AI Ethics and Compliance: Insights from Kay Firth-Butterfield

As AI becomes a cornerstone of enterprise operations, CIOs and data center leaders face the dual challenge of driving innovation while ensuring ethical and compliant AI deployment. Kay Firth-Butterfield, CEO of Good Tech Advisory, Time 100 Impact Awardee and a global leader in AI ethics, shared her expertise on these critical issues for the enterprise of the future. Her insights highlight the urgency of embedding ethics, compliance, and sustainability into AI strategies to stay competitive and trustworthy in today's fast-evolving landscape.



Why AI Ethics is a Whole-Business Responsibility

"Responsible AI isn't just a tech issue; it's a whole-business issue," Kay emphasized. Organizations must approach AI ethics holistically, involving every department from IT to compliance and sustainability teams.

A key starting point is education. "Every board, C-suite, and employee should complete an AI 101 course. Not to become data scientists, but to understand AI's capabilities and limitations," Kay explained. This foundational knowledge empowers employees to align AI strategies with organizational values while identifying potential risks.

Creating a culture of accountability is equally critical. "Create an environment where it's okay for someone to say, 'This might not be a good use of AI it could be risky.' That's how you build trust and accountability," she added.



The Compliance Landscape

The regulatory landscape for AI is evolving rapidly. The EU AI Act, for example, is set to redefine global standards for AI compliance. Kay highlighted the complexity of navigating these regulations: “Work with your general counsel to interpret the AI Act and categorize your AI use cases by risk level. Without a clear understanding of how AI is being used across your organization, compliance is impossible.”

In the U.S., the executive order “Removing Barriers to American Leadership in Artificial Intelligence” (Executive Order 14179) places greater responsibility on businesses to develop AI systems that manage risks such as cybersecurity threats, ethical concerns, and operational transparency.

For example, although no new SOC 2 standards specifically for AI have been introduced, auditors are increasingly emphasizing AI-related data handling under existing security, privacy, and confidentiality criteria. As Kay noted, “You’re on your own in unregulated markets. Frameworks like NIST or ISO can guide you, but the responsibility to self-regulate is significant.” For CIOs and data center leaders, this means adopting robust internal compliance and risk management strategies to safeguard data, mitigate operational risks, and maintain trust with stakeholders in a less regulated environment.

Cascading Risks: Why Oversight is Critical

One of the most critical risks in AI deployment is what Kay referred to as “cascading risk.” She explained, “If one AI system misunderstands its task and that error propagates to others, it can create a domino effect. The question is, where do you insert human oversight to prevent these issues?”

Kay advocates for dynamic governance frameworks to address these risks. “Your governance model should evolve alongside your AI systems. Review it regularly—monthly, if necessary—and ensure it aligns with your responsible AI strategy,” she advised.

With the IDC projecting a 40.5% compound annual growth rate (CAGR) in AI data center capacity through 2027, the stakes are high. However, scaling AI adoption involves more than infrastructure expansion. Barriers such as a lack of skills among staff, hiring challenges, implementation costs, regulatory gaps and strict data standards pose challenges. For C-Level and IT Leaders, governance and oversight must address not only operational risks but also foundational adoption challenges like workforce readiness and compliance. Tackling these head-on ensures AI strategies are scalable, efficient and sustainable.

Balancing AI Growth with Sustainability

AI workloads are driving unprecedented energy demands, with IT projected to consume 8.5% of global electricity by 2035.[15] Data centers, as key enablers of AI, are at the forefront of this energy boom.

Kay highlighted the environmental implications of AI operations. “Every time an employee asks a large language model (LLM) a question, it uses about a quarter of a liter of water. Some of that water is recycled, but not all. Data centers must lead in sustainable AI practices,” she said.

Innovative energy-saving solutions are paving the way for more sustainable data center operations. By leveraging advanced energy monitoring and management systems, data centers can optimize power usage, reduce waste, and improve efficiency. For example, automated systems that continuously calculate Power Usage Effectiveness (PUE) and

15 Global electricity demand: what’s driving growth and why it matters? Oxford Institute for Energy Studies, 2025



track energy metrics enable organizations to identify inefficiencies and take corrective action in real time, all within a Physical and Cyber Secure environment. These advancements not only help reduce operational costs but also align with regulatory frameworks like the European Energy Efficiency Directive (EED), which emphasizes transparency and accountability in energy performance reporting.

As critical IT infrastructures face increasing energy demands driven by AI workloads, implementing these power efficiency and sustainable practices are essential for reducing environmental impact while maintaining compliance with evolving regulations.

Addressing Bias and Discrimination in AI

Bias in AI models remains a significant hurdle, particularly for organizations relying on third-party solutions. Kay emphasized the importance of due diligence in procurement. “Ask tough questions before adopting AI models. How will they align with your responsible AI strategy? What safeguards are in place to minimize bias?” she advised.

Kay also highlighted the value of diverse teams in AI development. “If all your coders are under 30 and male, you’re likely to embed biases into your models. Include women, people of color, and non-coders to bring diverse perspectives,” she said.

The Path Forward: Collaboration and Continuous Improvement

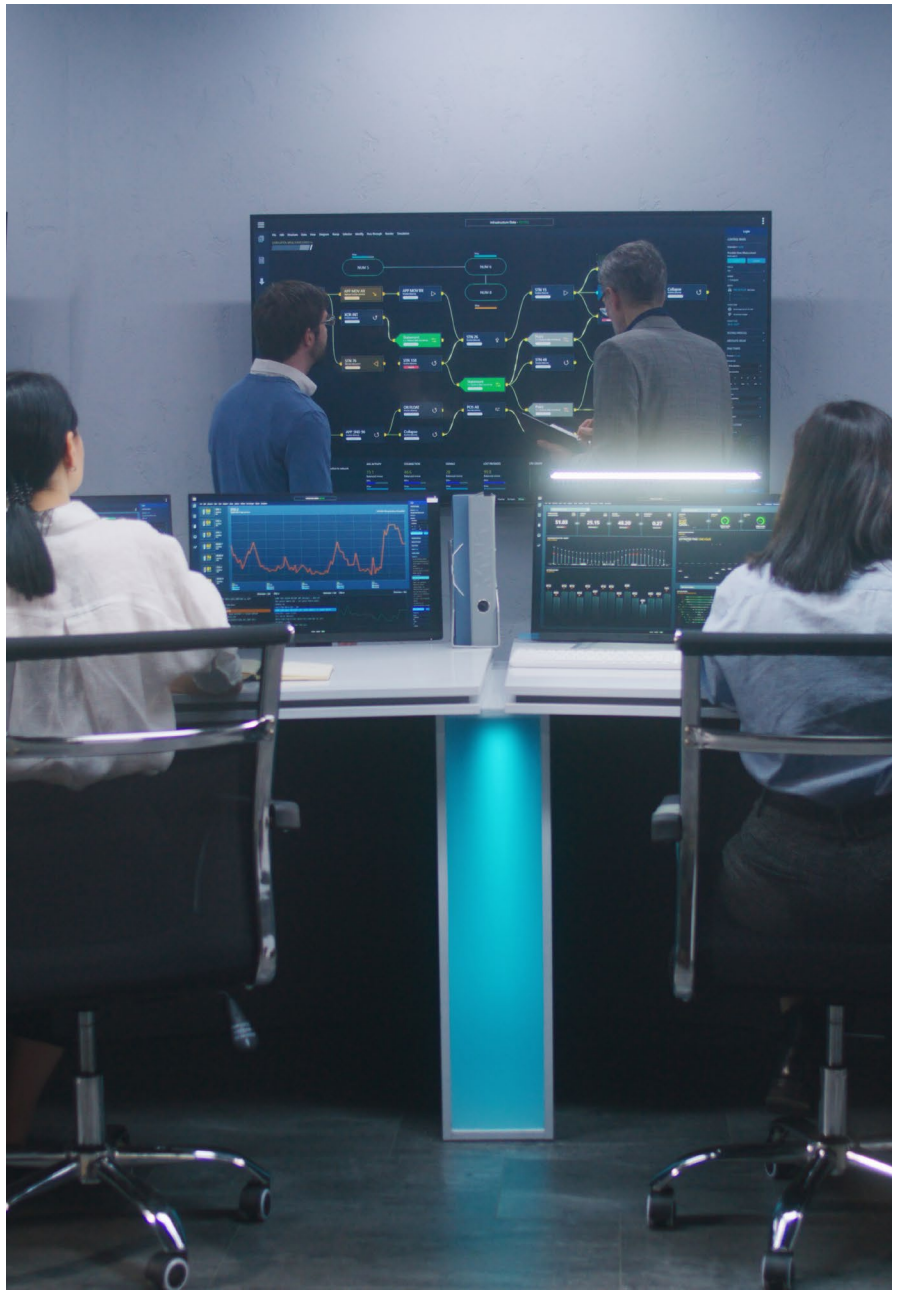
Collaboration is the cornerstone of responsible AI. Kay emphasized, “Responsible AI is a team sport. Whether it’s working with your legal team, sustainability experts, or external advisors, no one department can do it alone.” Organizations must break down silos and foster cross-departmental cooperation to ensure AI strategies are ethical, transparent, and aligned with broader business goals. By uniting expertise from diverse areas such as compliance, IT, and sustainability, businesses can address the multifaceted challenges of AI adoption and build systems that inspire trust and accountability.

For CIOs and IT leaders, the message is clear: responsible AI requires a proactive, holistic approach, to navigate the complexities of AI while fostering trust and accountability.

Your Next Steps: Build Trust and Resilience in AI

The future of AI in Data Centers and Edge IT infrastructure is as much about compliance and ethics as it is about innovation. As Kay aptly put it, “AI is a tool to help humans, not to replace them. By keeping this principle at the core of your strategy, you can harness AI’s potential while staying true to your ethical and compliance commitments.”





Key Takeaways for CIOs and IT Leaders

Educate and Empower Teams: Provide foundational AI training for employees at all levels and foster a culture of accountability.

Map AI Usage: Maintain a comprehensive inventory of AI deployments across your organization.

Evolve Governance Frameworks: Regularly update governance models to address emerging risks.

Prioritize Power Efficiency and Sustainability: Adopt energy-saving solutions, optimize infrastructure, and integrate renewable energy to reduce AI's environmental impact.

Foster Diversity: Build inclusive teams to minimize bias in AI models.

Collaborate Across Departments: Engage legal, sustainability, and external experts for a unified approach.

Edge IT and Data Centers at the Crossroads:

Steven Carlini on the Next Chapter of Energy Efficient and Sustainable Enterprise Digital Infrastructure

As the digital economy surges forward, data centers are not just the engines of AI and Hybrid IT transformation. They are at the heart of the world's energy efficiency and sustainability journey. Few understand this intersection better than Steven Carlini, Vice President of Innovation and Data Center at Schneider Electric and Forbes Councils Member. In this interview, Carlini shares how the sector is rewriting the rules for growth, resilience, and environmental leadership.



The Sustainability Imperative: Beyond Greenwashing

For Steven Carlini, sustainability is no longer just a talking point—it's a core business responsibility and a societal expectation. Schneider Electric's White Paper 67 was developed to bring clarity to this challenge for data center operators, providing a clear framework for IT infrastructure sustainability and identifying the metrics that matter most. As Carlini explains, the paper "proposed five categories because sustainability has a lot of contexts; they include energy use, greenhouse gas emissions, water use, waste, and local ecosystem."

The urgency behind these metrics is only increasing as AI and digital services drive unprecedented growth in data center activity. With global data center electricity consumption expected to double between 2023 and 2028, reaching 857 TWh[16], data centers are consuming more resources than ever.

To put this into perspective, that's nearly equivalent to the combined 2024 electricity demand of the UK, Italy, and Spain.[17] As a result, the environmental footprint of IT infrastructure is coming under intense scrutiny. In response, organizations are being called to go beyond traditional efficiency goals, such as extending the life of IT equipment and prioritizing recyclability from servers to UPS batteries.

Today, simply optimizing for uptime or cost is not enough. The conversation has shifted: energy use, emissions, water consumption, and waste management are all under the spotlight. As Carlini puts it, "how they're dealing with all the waste is starting to come up now a lot more." The data center industry is being called to lead by example, setting new standards for transparency, accountability, and long-term impact.



16 IDC, AI Datacenter Capacity, Energy Consumption, and Carbon Emission Projections, 2024

17 Ember Electricity Data Explorer

Rethinking the Energy Equation: From Consumers to Grid Partners

One of the most exciting shifts Carlini describes is the changing relationship between data centers and the energy grid. This, in part, is being accelerated as AI factories and data center capacity is expected to grow at a compound annual growth rate of 40.5% through to 2027[18], adding new pressures to scale efficiently and sustainably. "There's a lot going on with the delivery of energy from the grid," he says. Data centers are no longer just plugging in, but they are becoming "part of the grid ecosystem," actively working with utilities to balance supply and demand.

These are not just for backup anymore: Strategic charging and discharging these battery energy storage systems means data centers can use stored power to run their operations more efficiently, especially during periods of peak demand or when renewable generation is high, while also enabling them to support the grid by feeding power back or participating in demand response programs when needed.

Carlini points to a new era of collaboration between data centers and utilities. "There are contracts being signed, where as a data center operator, you agree to provide operational flexibility," he explains. Initiatives like Data Center Flex, where "utilities and data center operators are collaborating and automating the power delivery and power use on the demand side," are setting a new standard for how digital infrastructure can actively support grid stability and sustainability. Real-time energy management enables data centers to optimize their operations, balance renewable generation, reduce emissions, and create new value streams for both operators and the communities they serve. This kind of partnership exemplifies the future of resilient, flexible, and sustainable digital infrastructure.

18 Schneider Electric, The metric is the message: Introducing a comprehensive data center sustainability standard, 2022

Driving Innovation in Power Usage and Efficiency

Carlini sees efficiency as the next big leap for sustainable data centers, especially when it comes to cooling high-density racks. “There’s immersion that’s somewhat niche, and then there’s direct-to-chip, which seems to be the way most of the liquid cooling deployments are going for accelerated compute AI.”

While immersion offers substantial efficiency benefits, Carlini is quick to point out its practical challenges: “Immersion is more efficient, but can be more complicated and messy to use.” That’s why most operators are turning to direct-to-chip liquid cooling, which delivers many of the same advantages but with far less operational complexity.

Even with advanced direct-to-chip liquid cooling, a hybrid approach is the norm. “Usually, you have a ratio of about 80% of the power handled by liquid cooling, but you’re also going to need about 20% for air cooling,” Carlini notes. “It’s not 100% liquid cooling as you are only cooling the chips—you still need some air for the other components that aren’t being directly cooled by the liquid.” He sees the sector “definitely moving in the direction of more liquid cooling for the high-density racks,” but acknowledges that a mix of solutions will remain essential for the foreseeable future.

The industry’s focus on efficiency is reflected in global benchmarks, a PUE of 1.2 was once considered near perfect, but leaders like Facebook have pushed this even lower, achieving a PUE of 1.0783. Today, other hyperscale operators are also reaching or surpassing these levels, as continuous innovation in cooling and energy management raises the bar for the entire sector. Regulators are also raising the bar—China and Singapore now require new data centers to meet a PUE of 1.3 or better, setting aggressive standards for energy performance.



Carlini also highlights new opportunities to drive efficiency gains beyond the cooling technology itself. “The chillers for liquid cooling don’t operate at the same low temperatures that air cooling chillers do,” which opens up “opportunities for free cooling in a lot of environments.” Technologies like turbo core compressors and variable frequency drives are helping data centers “dial in even more savings” by optimizing how cooling systems operate under different loads.

In some markets, regulation is accelerating this innovation. “In Germany, they require heat reuse. That’s where you have to take the heat that’s coming out of the data center and use it for productive purposes.” These kinds of requirements are prompting data centers to explore new ways to leverage efficiency as both an operational advantage and a source of broader community value.

Monitoring, Measurement, and Compliance

For Carlini, measurement is the foundation of meaningful progress. “You can’t optimize what you don’t measure.” As sustainability reporting becomes a core requirement for data centers, having the right tools and processes in place is essential. Operators must be able to input data center characteristics, access real-time insights, and break down carbon emissions in ways that are both actionable and transparent.

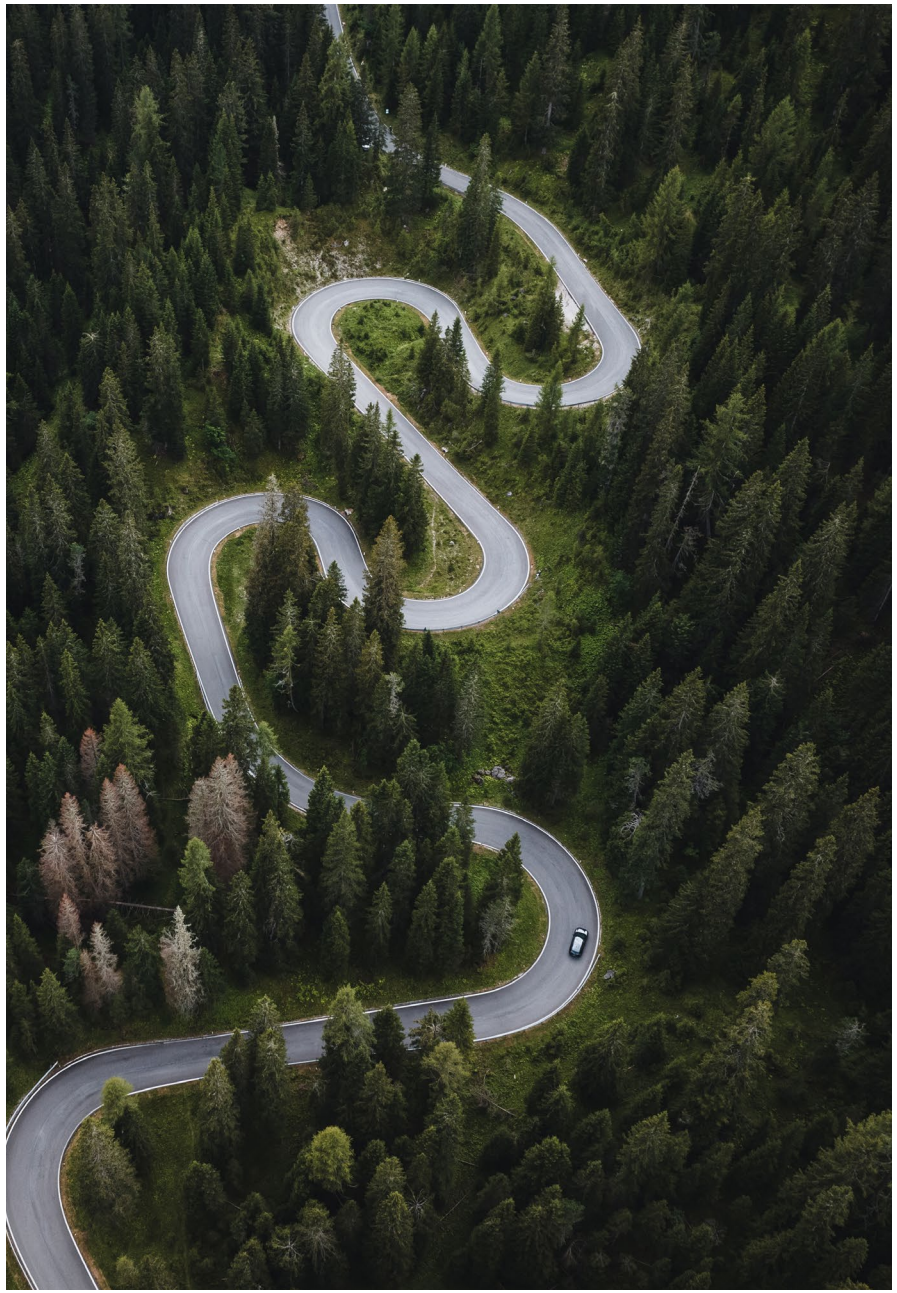
As part of this emphasis on transparency and actionable data, online tools are available that enable organizations to estimate and analyze the carbon footprint of their data center operations. For example, Schneider Electric’s Data Center Lifecycle CO2 Calculator allows operators to model emissions across the full lifecycle of their facilities, supporting more informed decision-making and effective sustainability strategies.

Sustainability reporting is no longer optional. New European regulations, such as the Energy Efficiency Directive (EED), require organizations to track and report on a broad set of metrics, including energy use, greenhouse gas emissions, water use, waste, and local ecosystem impact, making transparency and actionable data more important than ever.

This level of visibility is increasingly critical as regulations tighten, particularly across Europe. Organizations need to track, manage, and improve their sustainability performance with confidence, ensuring that all aspects of IT operations, from power usage to emissions, are accounted for and verifiable.

Carlini underscores the growing importance of compliance: “Now, with the new regulations coming, you have to be able to show how you got the data and then have that source be audited.” Robust measurement and clear reporting are not just best practices, they are essential for meeting regulatory demands, client expectations and building enterprise trust. With that, a tool called Resource Advisor provides local templates for streamlined reporting as well as better accuracy and reliability of reporting.





Regulation, Reputation, and the Road Ahead

Regulatory compliance is only part of the equation. Increasingly, competitiveness and reputation hinge on sustainability leadership. Carlini points to Europe as a prime example, where the regulatory bar is rising fast. “There’s definitely more regulations, and it’s effective.” The message is clear: “When you’re trying to get permits for data centers, the ones that are the most sustainable definitely have preference over the ones that are not.”

This shift is not just about meeting minimum standards – it’s about gaining an advantage. Sustainable operations are becoming a strategic differentiator, shaping how quickly projects move forward and how brands are perceived by customers, investors, and the community.

Carlini sees the industry’s influence extending far beyond its own footprint. “Data centers are the one industry that is funding a lot of the renewable energy generation through power purchase agreements.” By driving demand for clean energy and pushing energy producers to adapt, the sector is helping to accelerate broader changes in global energy strategies. As Carlini puts it, “It’s really asking the energy producers to change as well, which then is driving a lot of governments to rethink their energy strategies.”

For IT leaders, the road ahead is clear: sustainability is not just about compliance, it’s a catalyst for innovation, influence, and long-term success.

Looking Forward: Data Centers as Catalysts for Sustainable Progress

Steven Carlini sees data centers playing a much bigger role than just powering our digital lives. In his view, they are starting to shape how we think about—and use—energy on a global scale. With increased investment in renewables and a steady stream of new technologies, data centers are emerging as leaders in the transition to cleaner and more resilient IT infrastructure.

By prioritizing innovation, transparency, and purpose, IT and data center leaders can set the standard for responsible IT infrastructure, not only shaping their success and delivering value to their business but also supporting the sustainability of the broader economy, society, and the planet.

Key Takeaways for CIOs and Data Center Leaders

Embrace Collaborative Energy Strategies: Data center operators should partner with utilities to integrate renewable energy sources and contribute to grid stability, positioning themselves as essential players in the broader energy ecosystem.

Maximize the Value of Batteries and Storage: Modern battery systems can do more than provide backup, they enable smarter energy use, support peak demand management, and open up opportunities to participate in grid services.

Prioritize Measurement and Reporting: Robust DCIM tools and processes for tracking energy use, emissions, and other sustainability metrics are essential for driving improvement and meeting regulatory requirements.



Invest in Continuous Innovation: With AI driving higher rack densities and more demanding workloads, data centers must continuously evolve their infrastructure. This means adopting advanced cooling technologies and energy management, as well as leveraging AI-driven solutions for configuration, monitoring, and predictive, condition-based maintenance. Schneider Electric's DCIM platform and predictive maintenance services (see more here) empower enterprises to optimize performance, anticipate issues before they arise, and manage complexity as AI adoption accelerates.

Make Data-Driven Decisions: Sustainable progress begins with accurate measurement—monitoring water and energy use, identifying optimization opportunities, and making data-driven decisions are crucial first steps. Schneider's own journey aiming for net-zero operational emissions by 2030 demonstrates how actionable insights and data-driven strategies accelerate results, an approach that earned the company recognition as the World's Most Sustainable Company in 2024 by Time and Statista.

Shaping the Future of IT Digital Infrastructures

The path forward for digital infrastructure is clear: resiliency, efficiency, secure, sustainability, and innovation must go hand in hand. The expert insights in this series have shown that with the right strategies, technologies, and partners, organizations can not only meet today's challenges but thrive in a rapidly evolving landscape.

Schneider Electric is a global leader in IT infrastructures, digital transformation and energy management, and we're here to support you every step of the way. Whether you're optimizing energy use, strengthening cybersecurity, or preparing your data center for the next wave of AI-driven demand, our EcoStruxure™ IT solutions deliver the tools, visibility, and expertise you need to stay ahead.

We are the only specialist partner with ISO27001 and IEC 62443 certification, following a set of standardized security requirements and guidelines tailored for industrial control systems. This ensures your operations are secure, compliant, and future-ready.

EcoStruxure™ IT from Schneider Electric is a secure, cloud-based platform that gives you real-time visibility and control over your entire hybrid IT infrastructure—from anywhere. With advanced analytics, automated alerts, and actionable sustainability insights, EcoStruxure™ IT helps you optimize energy use, reduce downtime, and simplify compliance with evolving regulations, while meeting your sustainability targets.

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Curious how it can work for you?

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Let's Talk

About Schneider Electric

Schneider's purpose is to create impact by empowering all to make the most of our energy and resources, bridging progress and sustainability for all. At Schneider, we call this Life Is On.

Our mission is to be the trusted partner in Sustainability and Efficiency. We are a global industrial technology leader bringing world-leading expertise in electrification, automation and digitization to smart industries, resilient infrastructure, future-proof data centers, intelligent buildings, and intuitive homes. Anchored by our deep domain expertise, we provide integrated end-to-end lifecycle AI enabled Industrial IoT solutions with connected products, automation, software and services, delivering digital twins to enable profitable growth for our customers.

Explore our Life Is On customer success stories.

We are a people company with an ecosystem of 150,000 colleagues and more than a million partners operating in over 100 countries to ensure proximity to our customers and stakeholders. We embrace diversity and inclusion in everything we do, guided by our meaningful purpose of a sustainable future for all.

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