PUBLISHED BY 7X24 EXCHANGE INTERNATIONAL

1989 – 2024 35

35TH ANNIVERSARY

7X24 Exchange® INTERNATIONAL

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Exploring the Future of Green Data Centers:

Trends and Predictions

Page 7

CONFERENCE KEYNOTE

Zack Kass
Former Head of
Go-to-Market at OpenAI
Futurist and Visionary

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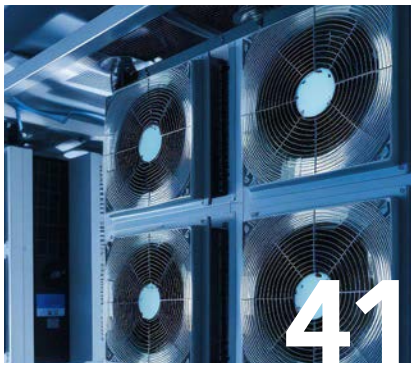

As a service to assist our valued members in staying informed about our dynamic industry, 7x24 Exchange is pleased to publish 7x24 Exchange® Magazine, offering articles by leading professional experts on current and future trends, best practices, and the state of our industry. Please note that the opinions and views expressed in these articles are those of the individual authors themselves, and do not necessarily reflect the views of 7x24 Exchange or any of our members.

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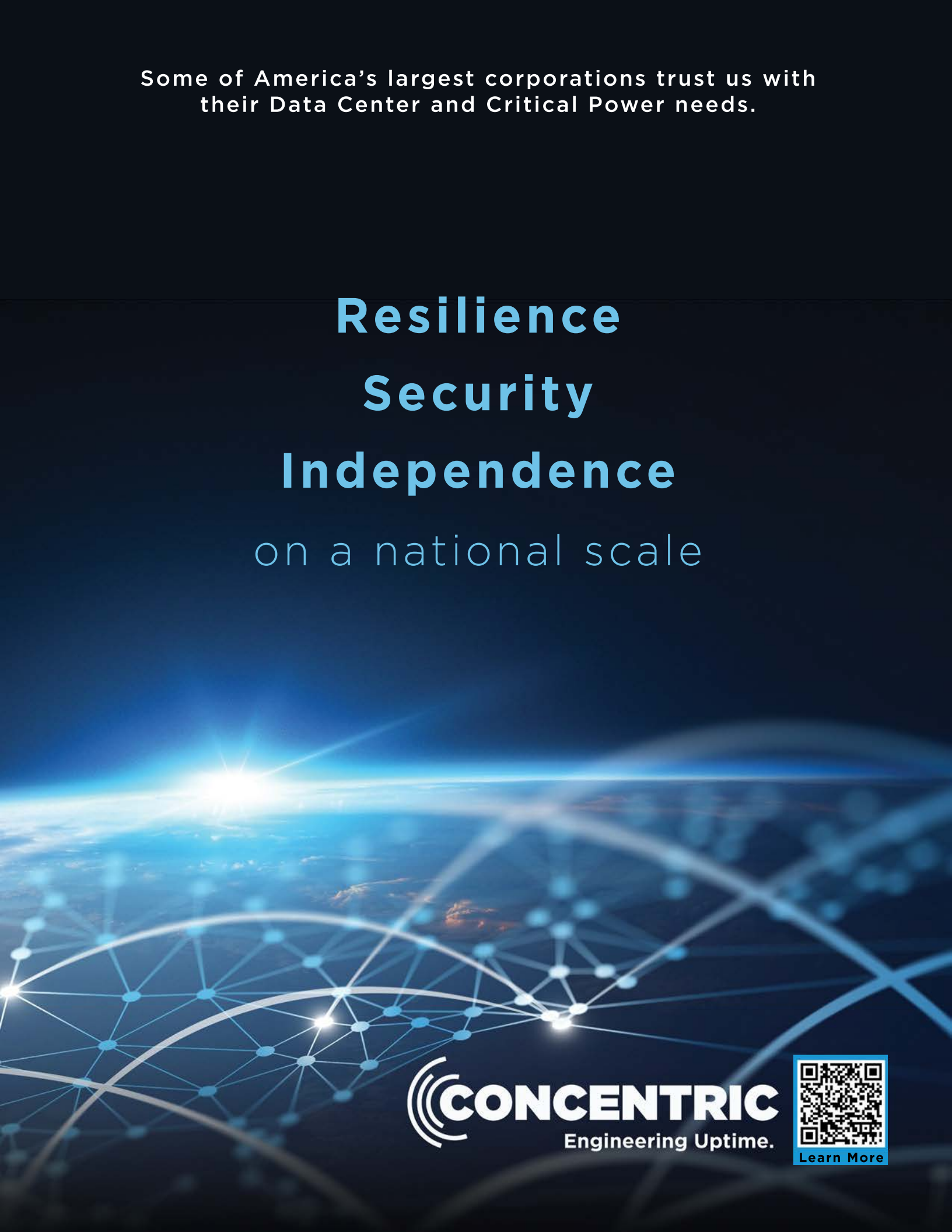

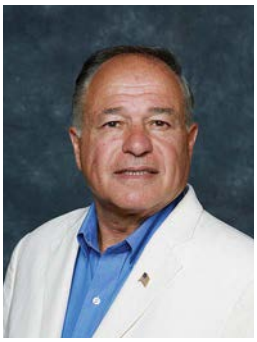

Robert J. Cassiliano

The theme for the 7x24 Exchange 2024 Spring Conference is "Industry Challenges and Trends". The trends are toward Artificial Intelligence (AI), Sustainability, and Data Center growth. This is occurring because AI technology is being adopted by many organizations around the world and in particular technology companies. There is continuing and more intense focus on energy efficiency, water conservation and sustainability. According to a McKinsey analysis, data center growth projections as measured by power consumption are expected to reach 35 gigawatts (GW) by 2030 up from 17 GW in 2022.

AI will require an increase in computer performance resulting in greater chip density and additional heat generation. Chip density will challenge manufacturers to extend Moore's Law and removing the additional heat production will require new and innovative designs in cooling technology.

The data center industry has done much to address energy efficiency but as an example of challenges are the gains made in Power Utilization Efficiency (PUE) which fell considerably from 2007 levels, but progress has flattened over the past decade. And water conservation with the use of river projects and aquifers has met with resistance from local communities and government regulation.

The challenge with respect to Data Center growth will be the ability to have the required technical skills to design, build, operate and maintain these mission critical facilities. International Data Center Day, powered by 7x24 Exchange is addressing this challenge through its mission to create awareness of the data center industry and inspiring the next generation of talent.

The goal of 7x24 Exchange conferences is to provide attendees with quality education, networking, and information sharing all in an environment designed for a memorable experience for attendees and guests. 7x24 Exchange is committed to providing value to members, conference participants, and their companies.

The theme for the 2024 7x24 Exchange Spring Conference being held at the JW Marriott Grande Lakes in Orlando, Florida from June 9-12, 2024, is End to End Reliability: "Industry Challenges and Trends". Conference highlights are as follows:

- Sunday evening Welcome Reception
- Data Center 101 Student Session
- Conference Keynote: "Leveraging AI for Good: AI's Potential to Redefine Productivity and Reinvent Employee Satisfaction" by Zack Kass, Former Head of Go-to-Market at OpenAI, Futurist and Visionary
- Keynotes by Aligned Data Centers and Uptime Institute
- Panel on Mega-Powers Unite – participants include Ampace Lithium Batteries, East Penn Manufacturing, EYP, Vertiv, and ZincFive
- WiMCO® Panel by Meta on Developing and Utilizing Physics-Based Models to Mitigate Ever-Changing Environmental Risks
- Talks from Google, JLL, Salute Mission Critical, Wick Fisher White and DPR Construction
- Panel on The Future of the Enterprise Data Center – participants include Blackrock, BNY Mellon, Ci, Skybox Datacenters, and Syska Hennessy
- Panel on Demonstrating the Value of Resiliency in Design of the Next Generation of Data Centers – participants include Buehler Engineering, Clark Pacific, EdgeCore Digital Infrastructure, and US Resiliency Council
- WiMCO® Networking Reception sponsored by Kimley Horn
- Exchange Tables on specific topics at Tuesday lunch
- Tuesday Night Sponsored Event "An Evening at Universal Orlando Resort"

The program content is designed to provide value to conference participants and their companies by focusing on important topics of the day. Artificial Intelligence (AI) in Data Centers, Debate on Battery Technologies, Sustainability and the Data Center 101 Student Session are highlighted at this year's Spring event.

I look forward to seeing you at the Spring Conference in Orlando, Florida!

Bob

Bob Cassiliano presents 2023 Fall Conference Keynote, Céline Cousteau, with a donation to The Javari Project on her behalf.

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Learn more at the 7x24 Exchange 2024 Spring Conference, or visit YORK.com/data-centers.

Johnson Controls

Exploring the Future of Green Data Centers:

Trends and Predictions

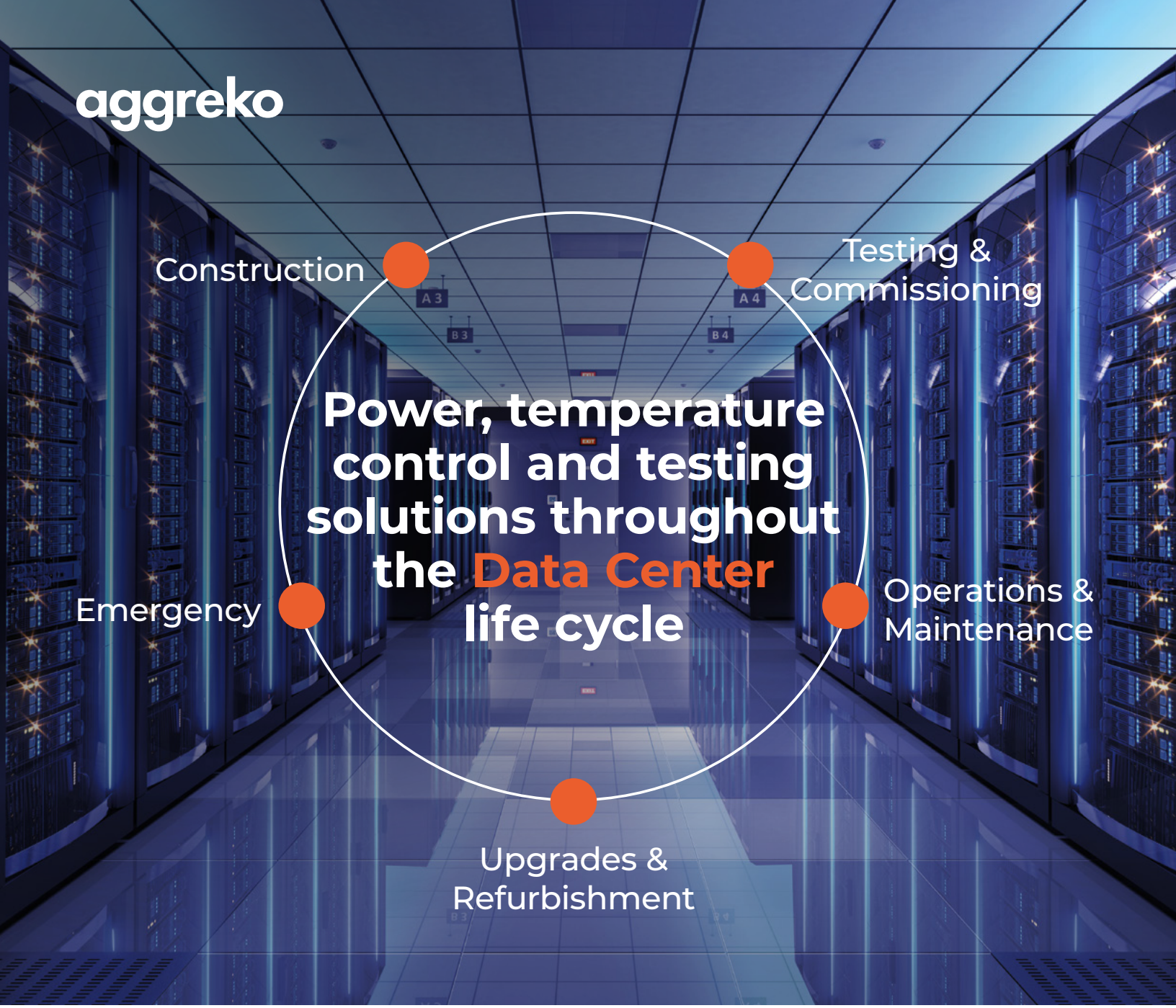
by Shalini Nagar

As businesses continue to rely on data centers to operate, it's imperative to consider the environmental impact of these facilities. Here are some actionable insights and suggestions for businesses interested in adopting sustainable practices for their data centers.

As we navigate through unparalleled digital growth, the data center is leading the pack in technological evolution. As of December 2023, we count roughly 10,900 data center locations worldwide. Over the last decade, they have undergone remarkable change, driven by the requirement to process data with unparalleled speed, security, and efficiency. Among the stunning technological advances transforming the data center industry, a tidal wave of progress is changing their ability to process and store data faster and more securely than ever before. From cloud computing, to artificial intelligence and the Internet of Things (IoT), a new generation has arrived that'll provide the digital horsepower that will reshape — and speed up — every facet of our daily lives.

GREEN DATA CENTERS: WHAT'S NEXT?

Emerging tech such as IoT (Internet of Things), big data, machine learning and AI finds itself being increasingly used nowadays. This will factor into the future of data centers and our climate. Over billions of connected devices will be creating a massive 79.4 zettabytes of data in 2025. The pressure is certainly on green data centers to become more energy efficient as climate change mitigation efforts ramp up. A net zero emissions well before 2050 is what the Intergovernmental Panel on Climate Change IPCC has called for green data centers.



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LATEST COOLING TECHNOLOGY

Cooling systems to maintain the optimal temperature of servers as processing intensity in data centers grows are a significant consumer of energy. Major strides in advanced cooling technologies will revolutionize the industry by 2024. Liquid cooling solutions are just one. Many utilize innovative substances and 3M's Novec is gaining popularity. What makes these systems so important is that they efficiently dissipate heat, which can significantly reduce the overall energy needed for cooling – and enhance the overall energy efficiency – of these facilities.

OPTIMIZING AI (ARTIFICIAL INTELLIGENCE)

Harnessing artificial intelligence's power is key to optimizing data center operations. AI is already employed to manage data centers with at least 25% of global data center capacity in the service of AI. AI algorithms are being used to predict server loads, and adjust power consumption dynamically in response. Management systems can flag underutilized servers that can be powered down, and have their workloads reassigned, to save up to 15% of the electricity a data center needs. More than that, AI-driven optimization is greening the data center.

ENERGY-EFFICIENT HARDWARE

In addition to software companies, hardware manufacturers also have a huge role in boosting energy efficiency in data centers. Currently, processors, memory modules and storage devices are being developed that require less power, yet work just as fast. By integrating more and more energy-saving technologies directly into their products, these manufacturers are steadily reducing the energy usage and overall carbon footprint of data center operators.

EDGE COMPUTING'S EMERGENCE

Over 29% of enterprise data centers have deployed edge computing in 2022. As more and more IoT devices hit the market, and more and more data is created at the edge, the need for real-time data processing there is clear. The potential of this trend is to allow the edge to take over for most cloud computing functions within the next 20 years, which will require significantly more data centers than are currently available, even for players the size of Amazon or Google. This doesn't even take into account another 100 billion smart devices expected to come online during the same time period.

HYPERCONVERGED AND COMPOSABLE INFRASTRUCTURE

The next steps in the evolution of data center infrastructure lie in hyperconvergence and composability. HCI refers to systems that integrate computing, storage, and networking in a single box, making them easier to manage and expand. Composable infrastructure builds on this by managing hardware resources using software at the moment they're needed. As data centers increasingly need to be able to serve new demands at a moment's notice, hyperconvergence and composability are likely to become commonplace in time.

GROWTH POTENTIAL AND FUTURE PROSPECTS OF THE MARKET

The Green Data Center market will experience significant growth over the next few years as demand for data centers that are sustainable and energy-efficient rises. According to a report by Research Nester, green data center market size is predicted to reach $975 billion by the end of 2036, with a CAGR of around 20% during 2024 – 2036. In 2023, the industry size of green data center was over $70 billion.

INCREASING ADOPTION OF RENEWABLE ENERGY TECHNOLOGIES

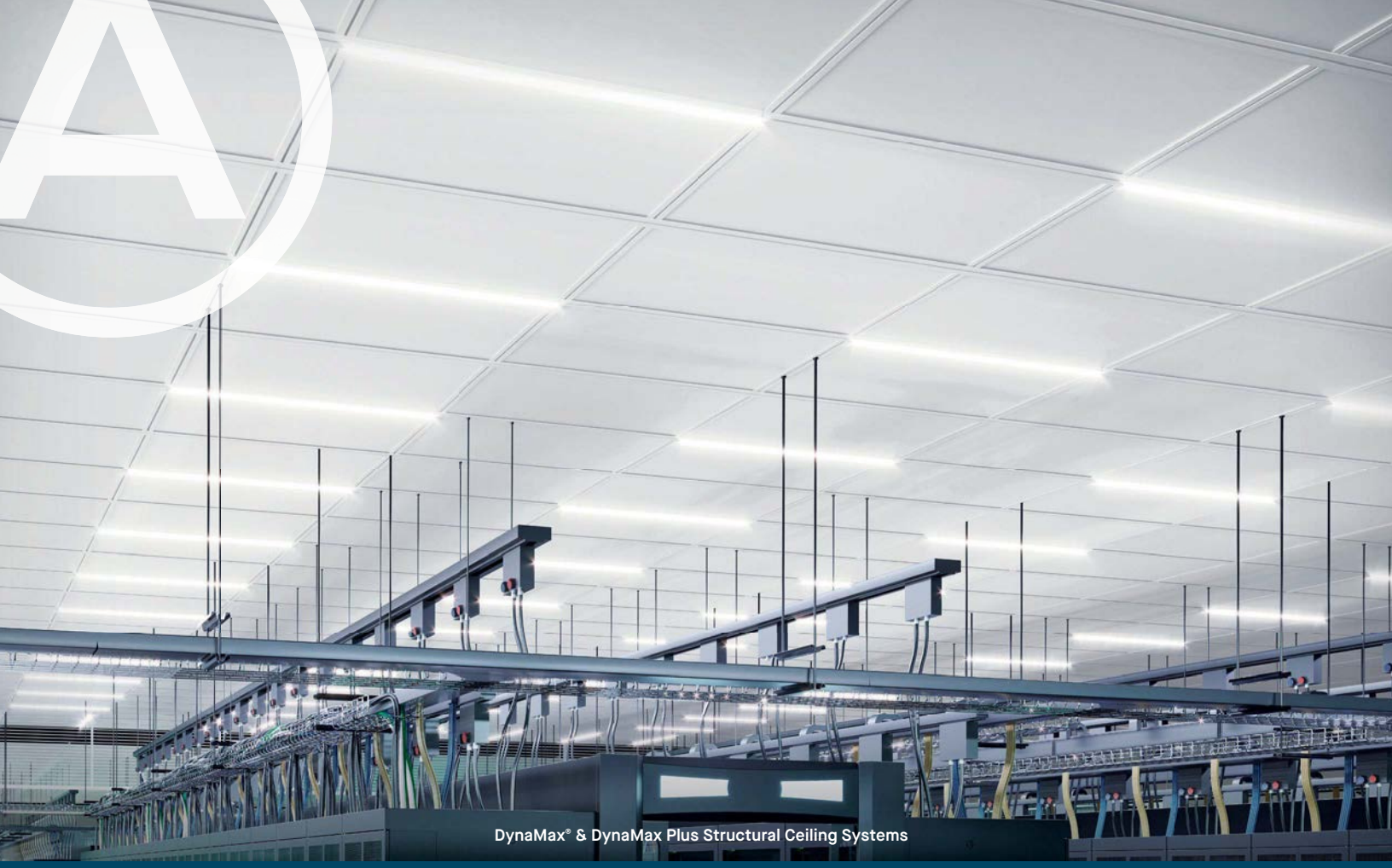
As traditional energy sources become more scrutinized from an environmental standpoint it's very likely that green data centers will be more obligated to rely on renewable energy instead. Solar panels and wind turbines generate electricity without releasing any greenhouse gases, and an average of 87-93% of the power needed to keep a windCORES data center operational comes directly from the host turbine. Hydroelectric systems, geothermal heat pumps, organic materials and other clean tech can be used to create that energy as well, and improved materials and designs could help build renewable energy sources that are as effective and cost-effective.

EMERGENCE OF SMART AND SUSTAINABLE DATA CENTER SOLUTIONS

Data centers of the future will be equipped with smart technologies and sustainable infrastructure to optimize energy consumption and reduce environmental impact. In the future, they will be equipped with intelligent systems and sustainable infrastructure to significantly reduce their environmental impact and energy use. Artificial intelligence and machine learning algorithms will operate in dynamic concert to adjust cooling and power distribution systems, while innovative technologies (like liquiGasre cooling) will ensure that waste is minimized.

ADVANCEMENTS IN ENERGY STORAGE TECHNOLOGIES

To ensure uninterrupted power supply and maximize the use of renewable energy, green data centers will invest in advanced energy storage technologies. These are expected to include batteries, Flywheel Energy Storage, Thermal Energy Storage and Hydrogen Fuel Cells, which can store excess energy generated during low-demand periods and use it during high-demand periods serving to reduce reliance on the grid and increase overall energy efficiency.



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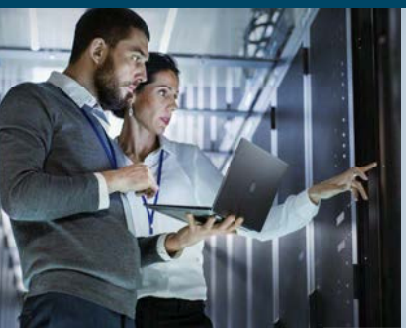

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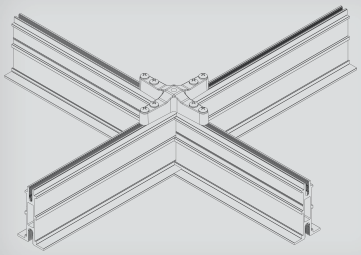

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INCORPORATING RENEWABLE ENERGY INTO DATA CENTERS: CHALLENGES AND SOLUTIONS

CHALLENGES

- High Energy Demand: Data centers have a substantial energy demand, making it difficult to rely on renewables alone for meeting that demand.
- Infrastructure Requirements: This means that renewables such as solar panels, wind turbine, or other renewables systems need to be installed on site, which is not trivial, nor cheap, and takes up space.
- Grid Integration: It can be complex to integrate renewable energy into the power grid that the data center draws from, and data centers need a very stable and reliable power supply.

SOLUTIONS

- Energy Efficiency: Improving data center energy efficiency reduces overall energy demand, making it easier to meet that demand with renewable sources.
- Hybrid Approach: A hybrid approach that combines traditional power sources with renewable energy can provide a more reliable and consistent power supply.
- Power Purchase Agreements (PPAs): PPAs allow data centers to enter into an agreement with renewable energy providers, ensuring a stable, and often cost-effective, supply of renewable energy.
- Energy Storage: Investing in an energy storage system, such as a battery, allows data centers to store excess renewable energy for use during peak demand periods or when renewable sources are not producing.

A LOOK AT THE KEY PLAYERS AND THEIR COMMITMENTS

- Amazon Web Services (AWS): AWS has made significant investments in renewable energy and has committed to achieve 100% renewable energy usage for its global infrastructure.
- Google: Google has been a pioneer in renewable energy procurement and has achieved carbon neutrality since 2007. It aims to power its data centers with 100% renewable energy.
- Microsoft: Microsoft has set ambitious sustainability goals, including becoming carbon negative by 2030 and removing all historical carbon emissions by 2050. It has also committed to 100% renewable energy for its data centers.
- Facebook: Facebook has a goal to be 100% supported by renewable energy for its operations and has made significant investments in renewable energy projects.
- Apple: Apple is committed to powering its data centers with 100% renewable energy and has made substantial investments in renewable energy projects.
- Intel: Intel revealed it was focused on energy efficiency in its data centers and had technology in place to reduce energy consumption. It aims to achieve net-zero greenhouse gas emissions from things like business travel by 2030 and global operations by 2040.

CONCLUSION

In summary, Green Data Center are a crucial element of the move towards curbing environmental impact and improving energy efficiency. With the increase of technology and need for storage data, the ability of data centers to move towards being environmentally friendly and sustainable is essential. By applying green technology and practices, data centers can heighten the efficiency and significantly lower their carbon footprints. Also, data centers can help drive humanity forward towards more sustainability.

Source:
https://www.researchnester.com/reports/green-data-center-market/5648

Shalini Nagar is the Content Writer of Research Nester. She can be reached at shalini.nagar@researchnester.com.

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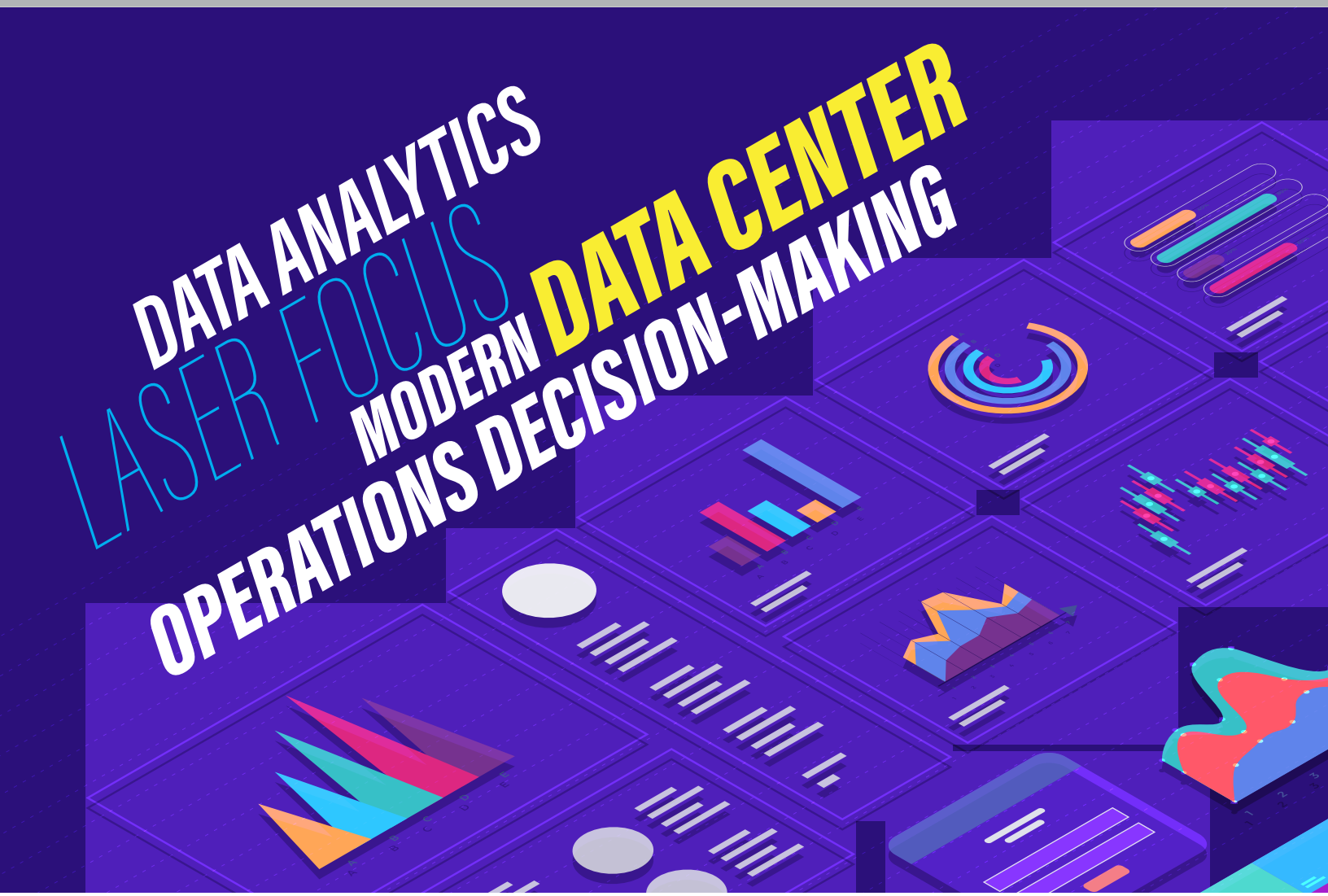

by Michael Skurla

Data analytics is more than gold in today's data-driven business decision making where nearly 92% of organizations last year "achieved measurable value" from their data analytics investments. The investment was also the driving force for 3 out of 5 organizations' business innovations.

With millions of data points indispensable to the operation of a portfolio, modern data centers' critical business decision-making focuses vastly on data analytics. Data captured from computing, network, and storage equip operators with insight into facilities' patterns and trends–along with a range of valuable, fact-based data insights–replacing impulsive business decisions with insightful logical predictions.

It's well-known that siloed raw data from existing IoT devices and in-building systems becomes most valuable when aggregated and analyzed in real-time. The historical context into the data center operations from IoT DCIM platform–deployed across Edge to hyper-scale data centers–not only provides real-time access to data but transforms raw data into actionable insight that optimizes business decisions to adapt to long-term scaling and changes. Access to a range of actionable analytics helps optimize operations and pre-empt equipment maintenance to prevent costly expenditures and avoid downtime. This benefits not just facilities' management, but financial stakeholders, and end-user clients.

Expedited business decisions, driven by data analytics from the DCIM system, also deliver business intelligence and real-time monitoring of equipment, sensors, and devices. These platforms provide a focused access point to aggregated data from various distributed data centers, streamlining operational intelligence and minimizing staff time wastage and downtime costs.

ADDITIONALLY:

- Offers insights into numerous geographically distributed sites without requiring extra hardware or changes to current systems.
- Instantly alerts about potential issues for prompt addressing, ensuring smooth equipment and operational efficiency.

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Data Center Energy Use Analytics

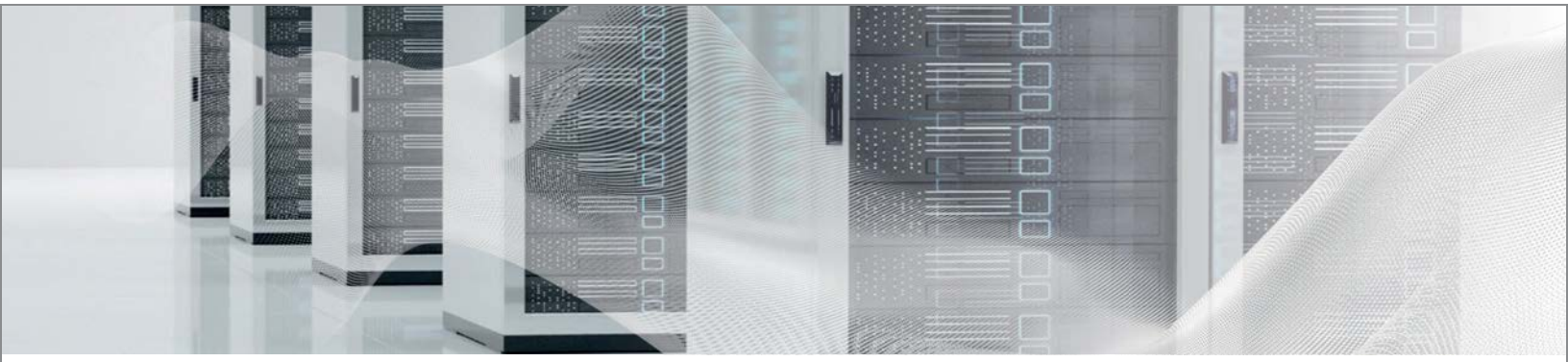
The energy management application is expected to dominate the overall building analytics market as energy costs continue to skyrocket. On an annual basis, commercial and industrial buildings in the U.S. spend $400 billion in energy costs and $120 million in unused energy. As little as a 10 percent reduction in energy spend can save up to $40 billion in annual energy costs–and help reduce greenhouse gas emissions by the equivalent of 49 million motor vehicles.

Since the largest energy consumer in a data center is the chilled water plant–with the average data center cooling system consuming about 40% of the total power–access to historical data points from DCIM platforms for the entire chilled water plant system (chillers, pumps, cooling towers) is priceless data. A review of the data points can help operators make minor tweaks to the control systems that can rake in anywhere between a 10% to 20% reduction in energy costs. In a large data center, this could translate into nearly $1 million annual energy savings.

Utilizing IoT DCIM data analytics provides access to the complete ecosystem of building automation and performance technologies, enabling the smooth implementation of recommended solutions. This approach assists plant operators in maximizing the value of their data warehouse and accelerates the deployment of these solutions across a portfolio of sites within a few weeks. Operators can apply optimized setpoints to their existing building controls without the need for new or additional hardware. Furthermore, a DCIM IoT Platform allows operators to remotely deploy and automate their facilities.

Mastering data-driven business decision-making takes time and practice. But with the right trusted software solutions in place, today's modern data center operators can power up some real savings in energy costs; all while having actionable, data-driven business decisions at a fraction of the cost.

Michael Skurla is the Chief Product Officer of Radix IoT. He can be reached at michael.skurla@radixiot.com.



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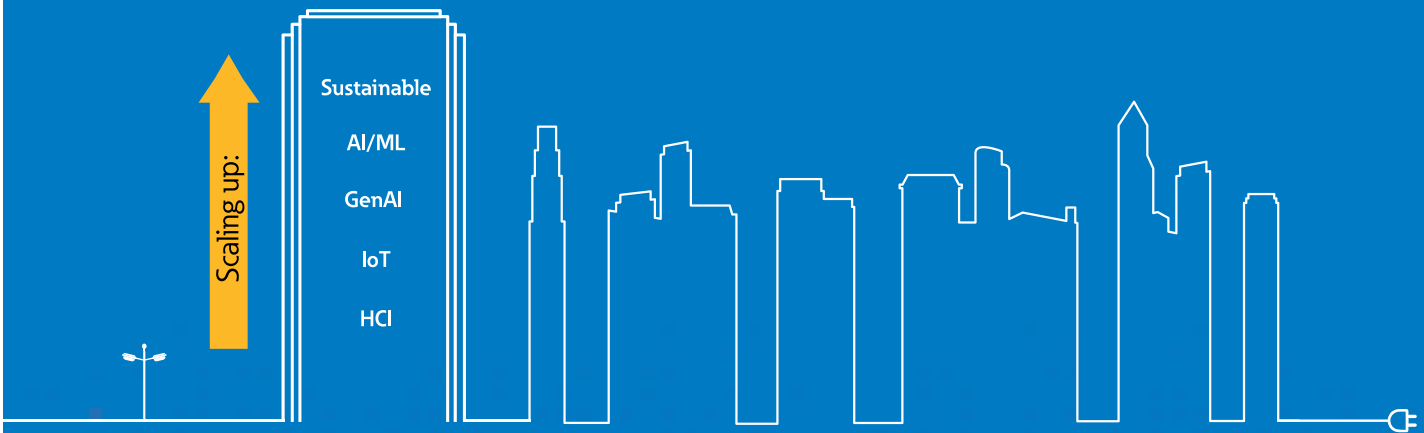

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A CONNECTED JOBSITE

Drives Productivity, Efficiency and Safety

by Chris Hann

The intense demand for new data centers is driving the need to build faster while maintaining safety. Meeting project sustainability goals is another top concern for investors, owners and contractors. A connected jobsite transforms data center builds, driving increased productivity, safety and security while paving a path to achieving lower greenhouse gas (GHG) emissions.

Data is the key to visibility and control. Real-time data produced by sensors, telematics devices and card readers and analyzed and presented by a cloud-based worksite management platform provides a 360-degree view of a project, including people and equipment. It allows companies to laser focus on opportunities to streamline operations, curb emissions and improve safety.

At the same time, a connected jobsite enables the automation of processes, conserving labor hours and saving time and money.

SEAMLESS ACCESS MANAGEMENT

The biggest data center investors now demand access-controlled jobsites. Connected jobsite technology automates access control.

For example, modular smart turnstiles authenticate entrants and deliver the ability to efficiently monitor who's on site. When an entrant scans a badge issued by a workforce management solution provider, a reader in the turnstile authenticates the person based on the profile associated with the badge and unlocks the gate.

Smart turnstiles reduce the number

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of security personnel required at entry points and expedite faster site entry and departure. By verifying the presence of workers on site and the hours they worked, they also improve efficiency and accountability and promote smarter deployment of human resources.

With some advanced worksite management platforms, user profiles from any third-party workforce management solution can be uploaded in a matter of minutes. Companies can then assign roles and privileges based on trade, training or other characteristics. As a result, the same RFID-enabled ID badges issued by the workforce management company can be used to restrict or grant access to the jobsite, to sensitive areas or zones and even to equipment.

SINGLE-BADGE ACCESS TO JOBSITES AND EQUIPMENT

Controlling access to forklifts, excavators and other pieces of equipment improves site safety. Leveraging RFID-enabled ID badges for equipment access provides a host of benefits.

Rather than enter a code on a keypad ignition lock, a worker can tap their badge on the lock's card reader to unlock a piece of equipment they are authorized to operate. This saves companies from having to assign hundreds or thousands of PINs, which are easily shared. Workers without authorization are prevented from operating the equipment, reducing the risk of injury and property damage.

Equipment access management creates a digital history of who used the equipment and when. This data trail increases accountability in the event a machine is damaged or left in the wrong place. It can also help support sustainability efforts by providing details such as who turned on a generator or other piece of equipment and how long it idled.

When keypads are added to restroom trailers and jobsite trailers, digital access management can help prevent vandalism and identify offenders.

OPTIMIZED EQUIPMENT PLANNING AND MAINTENANCE

An efficient jobsite has the right type of equipment and the right amount of equipment. Utilization tracking enabled by a worksite management platform facilitates smarter fleet planning.

Telematics devices installed in equipment send engine hours or run times to the platform. Managers can then run utilization reports that clearly identify over- or underutilized machinery and vehicles. They can leverage these reports to right-size and right-type their fleets. Selling or returning unnecessary equipment reduces costs and cuts waste, improving sustainability. Adding additional pieces of heavily utilized equipment reduces worker idle time, driving increased productivity.

Equipment may be so overutilized that workers hoard it, or so underutilized that it's left out of sight and forgotten. GPS tracking shows the real-time location of all equipment on a map, allowing companies to maximize resources.

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FEATURES

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Data on engine hours and run times serves another purpose: facilitating just-in-time maintenance. A just-in-time approach optimizes maintenance schedules compared to time-based maintenance, potentially reducing resource consumption and helping prevent both over-maintenance and equipment-related downtime.

SIMPLIFIED EQUIPMENT SHARING

When a general contractor rents all the equipment necessary for a project and shares it with trade partners, the result is increased efficiency and productivity. Sharing allows the GC to derive the most value from each piece of equipment while helping subcontractors preserve uptime. Equipment access management makes it much easier.

Normally, a GC that shares equipment must approve and process invoices for every individual piece of rental equipment used by each subcontractor. Utilization data produced by digital access control streamlines the process. A rental equipment vendor that offers a consolidated billing program can potentially free up hours of accounting staff time each month.

AUTOMATED EMISSIONS TRACKING

When it comes to reducing GHG emissions, identifying the best place to start can be challenging. Swapping out an entire fleet for lower-emission alternatives isn't practical. In most cases, it isn't even possible.

Identifying the largest sources of emissions on a jobsite lets companies make data-driven decisions about fleeting and fleet utilization and get the biggest return on their efforts. Tracking emissions also allows them to measure the results of steps such as switching to cleaner fuels or cleaner power generation equipment or choosing electric machines.

Emission tracking can be a highly laborious process, however. It typically requires collecting fuel usage data from each subcontractor and performing manual calculations to determine estimated emission

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for each piece of equipment. A cloud-based worksite management platform that offers an estimated emissions dashboard changes the equation. Fuel use is estimated based on engine hours provided by telematics devices. Estimated emissions are then automatically calculated using a published emission factor for the fuel type.

Automated emissions tracking may free up workers for other tasks while providing insights critical to increasing sustainability.

Access to real-time temperature and humidity data at any hour of the day or night eliminates unnecessary trips to the jobsite or warehouse. Notifications alert users when levels exceed predetermined thresholds.

Remote temperature control goes a step further. Devices attached to smart heaters allow personnel to adjust heaters without setting foot on site. Turning heaters down or off when they aren't needed saves fuel, which in turn cuts costs and reduces emissions.

STREAMLINED ENVIRONMENTAL MONITORING AND CONTROL

Monitoring and controlling temperature and humidity in onsite areas and storage warehouses is critical to protecting expensive, high-tech equipment, and to ensuring successful concrete curing. Yet manual 24/7 monitoring is inefficient and time consuming.

A connected jobsite streamlines the process. Sensors placed in key locations—including in concrete pours—enable remote monitoring via smartphone, tablet or computer.

A COMPETITIVE EDGE

Given the intense competition for the multi-billion-dollar revenues generated by data center operation, speed to market matters. Companies that leverage the transformative power of digital technology during data center builds gain a critical edge.

Connected jobsites enable faster, safer, more efficient construction. From project start to project completion, they hold the power to streamline and automate processes, maximize resources, boost safety and facilitate increased sustainability. For companies seeking to gain every advantage, they are rapidly becoming a must.

Chris Hann is the Business Development Manager - Data Centers at United Rentals. He can be reached at chann@ur.com.

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PIONEERING ECO-EFFICIENT DATA CENTERS:

Computational Storage Steps Up

by JB Baker

In the digital age, data centers stand at the forefront of technological advancement, underpinning the global economy's most critical operations. Yet, as these nerve centers grow, so does their appetite for electricity, presenting a formidable challenge in our collective quest for sustainability. Amid this backdrop, computational storage solutions emerge as a beacon of innovation, promising to redefine the landscape of data processing with unprecedented speed and energy efficiency.

The Imperative for Innovation

Data centers continue to grow in their position as significant consumers of global electricity, a trend that raises concerns about the environmental impact of our digital dependence. The booming demand for AI (and the high-power processors and systems needed for AI workloads) dramatically raised the visibility of the issues with data center power – powering just the H100 GPUs that NVIDIA shipped in 2023 could consume 4000GWhrs, and that's not including the rest of the systems and networking that goes along with them. Meeting this escalating demand for faster data processing and more data storage necessitates innovations in the data processing pipeline – that is, how and when data moves between storage, memory, and processors as well as when and where data processing functions are performed. Computational storage solutions answer this call, offering a transformative approach that enhances processing speeds while drastically cutting energy consumption.

More powerful processing with less power consumption

Improving efficiency is quite possibly the number one tool for meeting these growing demands for gathering, storing, moving, and processing data in a sustainable manner. Efficiency, in terms of "work done per Watt of energy consumed," is the overarching measure for sustainability.

Data center operators have long sought to improve their "PUE" (power usage effectiveness – how much of their power is used by the IT equipment vs how much power is used by other data center equipment such as the HVAC). Industry giants like NVIDIA note the need to meet the processing demands with fewer systems and processors.

And now, Computational storage drives (CSD) have emerged as a new tool for getting more from each Watt-hour of energy. CSDs are designed to improve application performance and infrastructure efficiency by integrating compute functions into the storage devices – moving some aspects of the processing to the

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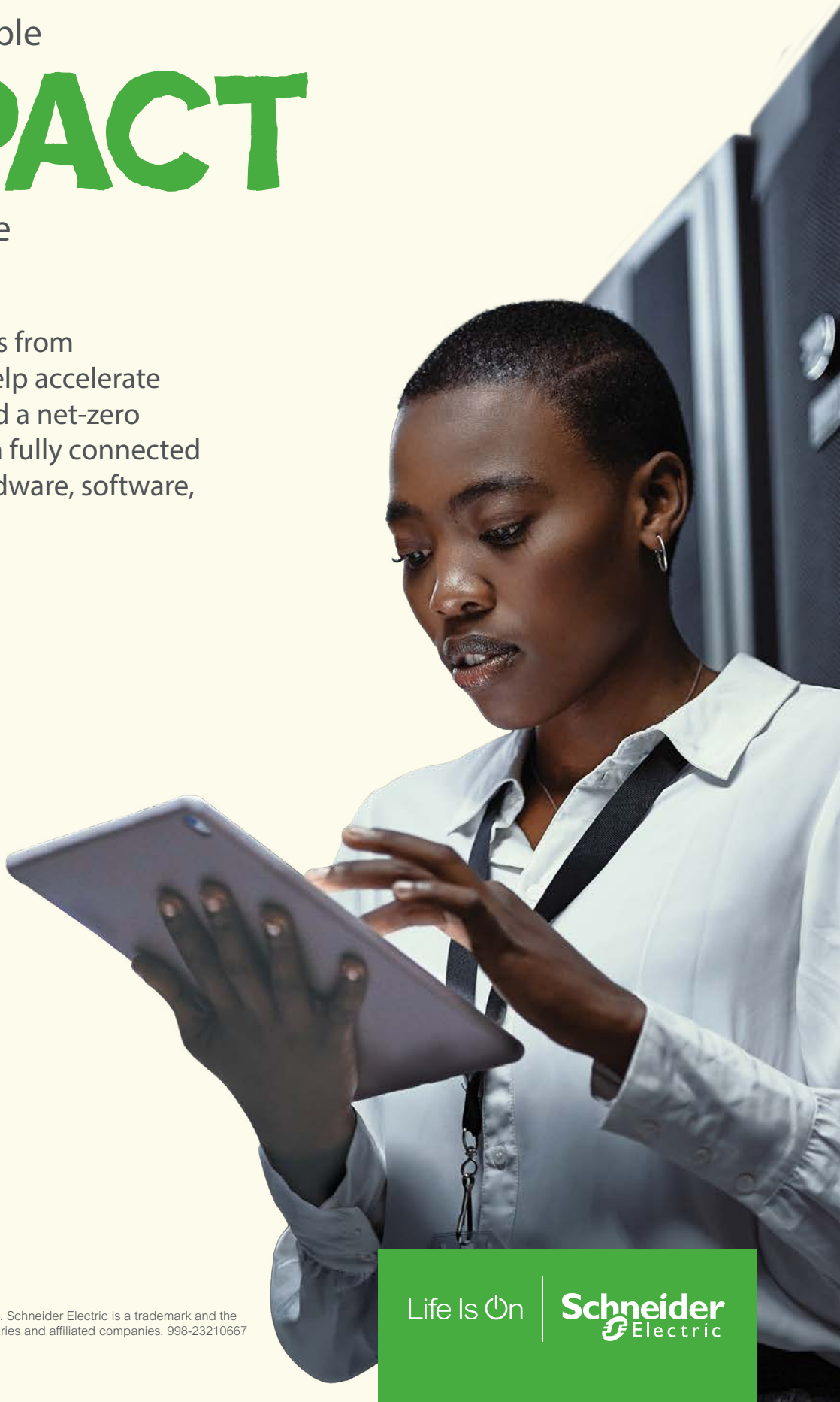

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drives. The architectural innovations in the CSDs result in not only improved performance, power efficiency, and sustainability at the device level, but also better efficiency for the system processors (CPUs and GPUs). CSDs have become a valuable tool in achieving the goal of doing "more work per Watt."

Global Efforts and the Drive Towards Sustainability

With environmental sustainability climbing the global agenda, technologies like computational storage are poised for mainstream adoption. They align perfectly with industry analysts' predictions and the growing emphasis on Environmental, Social, and Governance (ESG) goals within the corporate sector.

The Economic and Environmental Advantage

The cost and complexity of deploying new technologies are barriers that IT leaders face as they seek to operate more sustainably. Standards-based CSDs help overcome those challenges by offering significant cost reductions and enhanced performance, without requiring special skills, new software, or re-writing applications. Deploying CSDs in place of ordinary SSDs reduces overall hardware footprint, resulting in lower electricity usage and a smaller carbon footprint, for a sustainable solution that aligns with global efforts to diminish energy consumption in data centers. For companies committed to sustainability and efficiency, drives with computational storage represent an attractive proposition, marrying economic benefits with environmental stewardship.

Looking Ahead: The Future of Data Centers with Computational Storage

As the world grapples with the need for sustainable growth, the role of innovative solutions like computational storage becomes ever more critical. This technology is not just responding to current demands; it is shaping the future of the IT industry, contributing to a transformation in the efficiency and sustainability of data centers and the AI infrastructure. This vision aligns with the aspirations of technologists, executives, and leaders from Fortune 100 companies, and tech influencers globally, marking a significant step forward in our journey towards a more sustainable digital future.

JB Baker is Vice President of Products at ScaleFlux. He can be reached at mradmin@jotopr.com.

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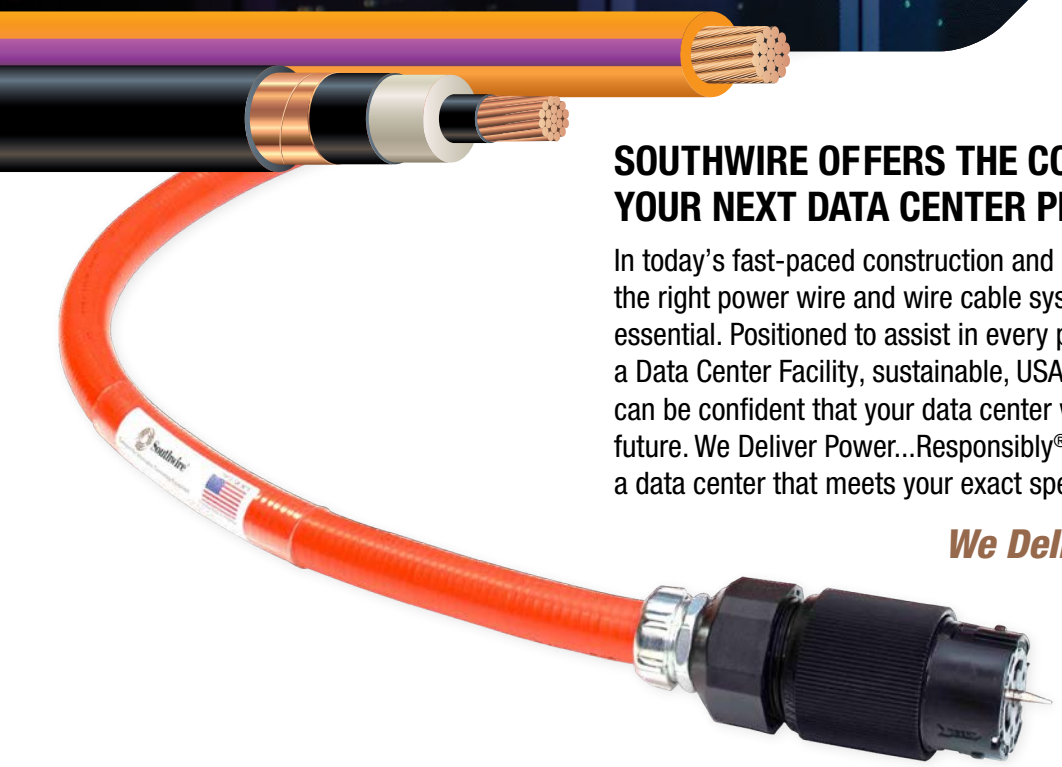

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by Adil Attlassy

The phrase 'The Sky is Falling' from an old folk tale seems to best characterize the current hysteria driven by unprecedented demand for digital capacity that outpaces our ability to build and bring facilities online. It's a modern tale of the disparity between supply and demand we're experiencing in the data center industry.

Over the past 12 months, demand for data centers has exploded to accommodate not only massive investments in AI but the continued growth in cloud computing spurred by the relentless need for global data volume. All that computing and data indeed need to live somewhere.

But we can only build so fast against a backdrop of skyrocketing demand when we deal with constraints like scarcity of land, limited power infrastructure, supply chain bottlenecks, permitting complexity, zoning, and workforce shortages – especially skilled workers.

Some see the current situation as an insurmountable challenge. It is not. To the fearful, I offer this advice borrowed from a time of great global turbulence: Keep Calm and Carry On.

First, some context drawn from history: We have survived and problem-solved our way out of prior industry challenges. The last time our industry faced what appeared to be our demise was the emergence of server virtualization and 1U micro-servers, which some thought signaled the end of the data center industry. On the contrary, it was simply a challenge that made us stronger.

A BIT OF HISTORICAL PERSPECTIVE

For perspective, let's take a walk down memory lane. We first saw an explosion of digital demand in the 1990s. That was the birth of colocation services. Companies big and small needed reliability to keep their websites and servers up and running, and colocation was the answer.

A little more than two decades ago, colocation was no longer sufficient, driving a need for wholesale data centers, and later, hyperscale facilities when clients needed an entire building or campus. And this was all before the advent of AI.

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During this frenzy of more data consumption, demand progressed from one cabinet to a cage, then half a hall, a whole hall, a building, half a campus, and then the whole campus. There's been a natural progression. The sky is not falling.

WE WILL FIND OUR WAY

There's another lesson history teaches us: the market has always found equilibrium and we will find undiscovered elements, invent new products, and conceive new ways to work, especially in time of need. Innovation is born when current trajectories are unsustainable, as now.

As a very real example, we have pushed silicon to its utmost physical limits. But there are new materials that represent breakthroughs in chip technology that could require less power and cooling.

Recently I read about a new NVIDIA Superchip, a breakthrough accelerated CPU designed for giant-scale AI and high-performance computing applications, delivering ten times higher data performance. That opens a whole new world of solutions for our most complex computing problems.

And there will be more exciting innovations across multiple disciplines in the IT spectrum – not just data centers – to enable us to support and thrive within the next wave of growth in computing.

NOT AN EVOLUTION, BUT A REVOLUTION

Today we are living in the fourth Industrial Revolution and staring down the fifth, driven by AI. Once upon a time, Industrial Revolutions were spaced out by a century or more. My colleague Chief Innovation Officer Nancy Novak has spoken on the dizzying waves of new technological advances. She says that we barely have time to digest new technology before it's time to recover, react and adopt new ones.

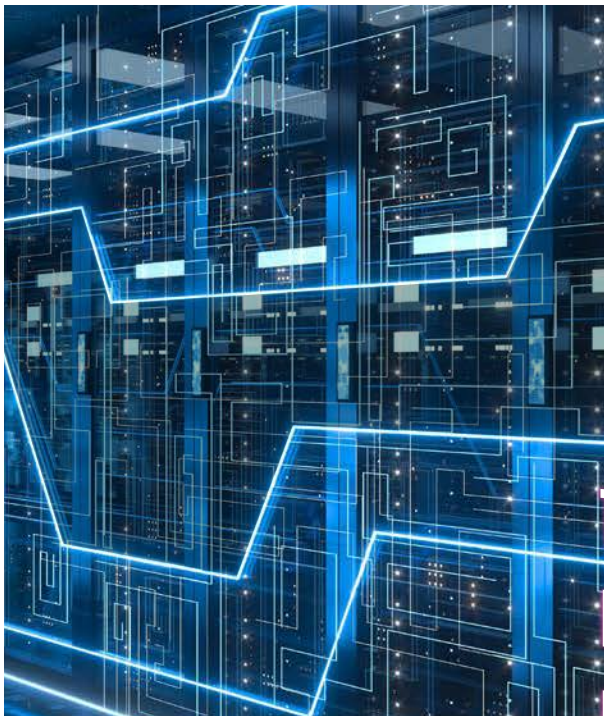
Now they come at us faster and faster. I've witnessed the birth of the internet, Colocation Services, hyperscale, Cloud Services and AI in my lifetime. While this era of momentous and frequent revolution may be terrifying to some, consider embracing the challenge and opportunity to innovate.

ADVICE ON KEEPING CALM

For customers concerned about the disparity between supply and demand and what it holds for the future, I offer this piece of advice: talk to your suppliers.

Engage them in an open conversation and ask them what worries them and what problems they're trying to resolve. They may be overthinking their issues and imagining their challenges are larger than they are. I've seen clients plan for hypothetical – not actual needs – that keep them up at night. This handwringing requires time and energy, when a better use of that energy may be collaborating on a solution with trusted partners.

Remember it's a smart practice to seek advice from colleagues and industry mentors. Bring a group together around a conference table – or virtually – and talk through the issue together. Different ideas, life experiences and perspectives can hold the key to solving problems we all face together.



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by Robert Trefz

Load banks provide solutions for testing and maintaining power and cooling systems within data center facilities. Data centers are crucial in supporting modern economic operations, facilitating technologies utilized in industrial and manufacturing setups, transportation, logistics, banking, education, entertainment, and beyond. The recent surge in digitization, propelled by shifts in business interactions and remote work trends, has amplified the significance of data centers. Their capacity to provide essential services hinges on the uninterrupted availability of electrical power.

The financial repercussions of downtime vary based on the data center type and the scale of the outage. Beyond the monetary aspect, downtime hinders users from accomplishing critical tasks, influencing the reputations of service providers, and potentially leading to penalties for failing to meet service level agreements. Given the pivotal role of power availability in delivering dependable services, the verification of power and cooling system capabilities becomes paramount in maintaining service continuity. Load banks are a valuable tool for testing and validating the performance of data center power and cooling systems, ensuring optimal operation and minimizing downtime risks.

HOW ARE LOAD BANKS USED IN DATA CENTERS?

There are several applications for load banks in data centers such as commissioning, expansion, and maintenance. Load bank and test type will vary based on the application.

COMMISSIONING

Throughout the life cycle of equipment, one can anticipate fluctuations in failure rates based on the equipment's relative age. As illustrated in Figure 1, the early stages of the life cycle typically exhibit high initial failure rates. However, as defective products are identified and installation errors rectified, the failure rate decreases. Subsequently, the equipment tends to operate with relatively low rates of failure. Towards the end of their service life, products may experience a resurgence in failure rates.

Commissioning is the meticulous process of verifying equipment thorough testing upon installation, ensuring it aligns with the end user's requirements. This comprehensive procedure aids in uncovering potential issues and guarantees the proper and efficient functionality of components and systems. In the context of data center commissioning, critical systems undergo testing, encompassing backup diesel generators, uninterruptible power supplies (UPS), heating, ventilation, and cooling (HVAC) systems, electrical bus and distribution cabling, power distribution units, and remote power panels. This important step of load testing during commissioning allows for the identification and/or replacement of faulty components or systems before handing over the facility to the end-user. Given that the full facility load might not be consistently available during construction and commissioning, load banks serve the purpose of supplementing loads to simulate design conditions and to verify expected function.

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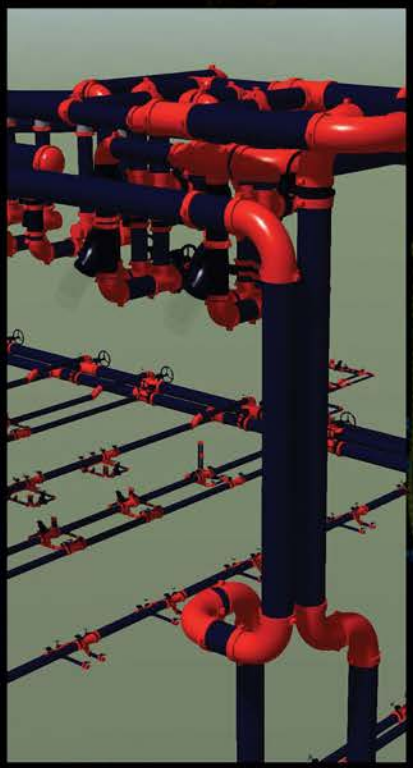

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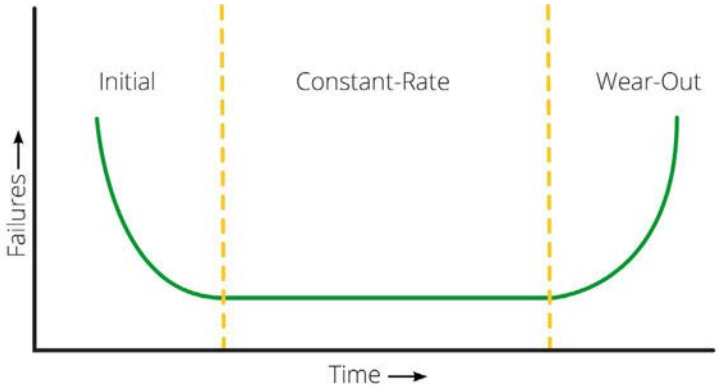

Figure 1 – Equipment Life Cycle

Load banks play a vital role in commissioning data center cooling systems by the strategic placement of resistive load banks in areas where future heat loads will exist, allowing for comprehensive testing of cooling systems. This testing serves to verify their capacity and fine-tune the balance of air flow distribution, ultimately optimizing cooling performance. To assess cooling performance across an entire server room, it may be necessary to position multiple load banks throughout the space. Streamlining this testing process involves networking the load banks to facilitate common control and data collection functions. The integration of networked load bank controls offers convenient operation and adjustment during tests, while automated data collection simplifies the evaluation and reporting of load test results.

MAINTAINING PROPER TEMPERATURE AND HUMIDITY

In some cases, data centers are commissioned and are operational before all the servers have been installed. In this situation, it may be difficult to maintain proper operating temperature and humidity ranges as the data center's cooling system was designed with the expectation that servers are installed at capacity. Load banks can be used to replicate the heat load that would normally be created by the yet-to-be installed servers keeping the temperature and humidity within specification.

EXPANSION

Data centers are frequently designed with future expansion in mind. When expansion takes place, it becomes essential to test the operability and efficiency of new systems and components under load. Accurate simulation of the latest power and heat loads is crucial for this testing phase, and load banks play a key role in executing these tests. Employing multiple load banks helps simulate the electrical load that the new equipment will impose on the power distribution systems. Additionally, strategically placing resistive load banks at key points enables the verification of local cooling system performance. The resulting data can be automatically compiled into reports, providing evidence of compliance to customers who are purchasing server space.

MAINTENANCE

Many data centers employ a combination of backup UPS systems for short power interruptions and diesel generators for prolonged outages. Regular maintenance and testing of these systems are essential to guarantee their availability. Load banks are the most effective way in efficiently testing and subjecting electrical

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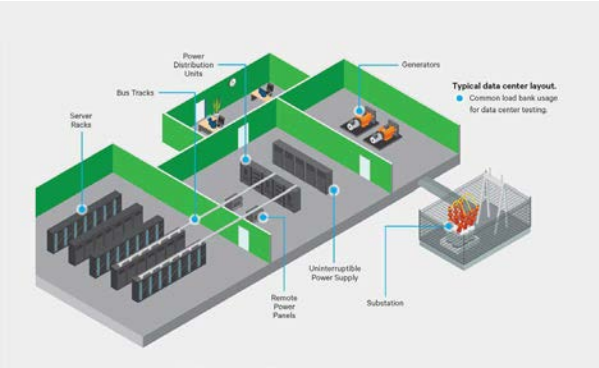

Figure 2 – A typical data center electrical backup power configuration.

systems to stress for maintenance and periodic testing requirements. Various load test configurations can be tailored for specific maintenance purposes in these applications. The generated reports pinpoint identified issues, enabling prompt resolution.

EQUIPMENT UPGRADES OR REPLACEMENTS

Upon replacement or repair of specific components or equipment, it is critical to validate their correct functionality. Load testing serves as an effective method to ensure the proper function and performance of repaired or replaced equipment before it is reintegrated into service.

WHAT TYPES OF LOAD BANKS ARE USED IN DATA CENTERS?

Load bank elements use resistive, inductive, or capacitive loads on circuits, or a blend of these. In the testing of data center systems, it is important to choose load banks that offer the specific type of load aligning with the characteristics of the equipment being tested. For example, circuits predominantly serving motor loads should undergo testing using an inductive load bank.

BACKUP DIESEL GENERATORS

Most data centers rely on one or more onsite diesel generators to supply power during utility outages. Ensuring the correct operation and maintenance of

Figure 3 – A sample of load bank test in data center.

these generators is essential for maximizing data center uptime.

Load bank testing is instrumental in verifying the availability and performance of generators. By simulating electrical loads, load banks help identify potential issues, enabling corrective actions to ensure backup power is readily available when needed. The load test serves to confirm the proper functioning of various components such as the voltage regulator, governor, cooling system, fuel system, and control system within an engine-generator.

Applying load during testing also mitigates the risk of diesel "wet stacking," a phenomenon occurring when generators operate with insufficient load. This condition can lead to the accumulation of unburned fuel residues, impacting engine components and potentially compromising reliability.

The choice between a purely resistive or a resistive-inductive load bank depends on the testing requirements. A purely resistive load bank evaluates the engine's ability to provide the rated kW and deliver an equivalent amount of kVA. On the other hand, a resistive-inductive load bank comprehensively tests the power supply by applying impedance currents out-of-phase with voltage.

Periodic load testing of diesel generators is essential, adhering to regulatory standards, industry codes, and customer requirements. In larger data centers with substantial loads, permanently installed, containerized, resistive-inductive load banks are often deployed to

Application	Type
Backup Generators	Resistive and Inductive Load Banks
Uninterruptible Power Systems	Resistive Permanent Load Banks
Heating, Ventilation, and Air Conditioning Systems	Resistive Portable Load Banks
Substation	High Voltage Load Banks
Power Distribution Units	Resistive Portable Load Banks
Remote Power Panels	
Bus Work	

The table above displays applications and the type of load banks that would typically be utilized.

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Leading load bank suppliers offer advanced control systems that facilitate automatic and transient load tests. The results of these tests can be archived and reviewed to assess generator performance over time. Alternatively, load bank control can be integrated into existing control systems commonly found in larger data centers.

HVAC SYSTEMS

Inadequate cooling can adversely affect the reliability of servers and other IT equipment. Load banks play a necessary role in HVAC commissioning processes. Given that load banks generate heat as they dissipate electrical power, they are employed to replicate the heat output of IT equipment. By observing an HVAC system's response to this simulated heat, the effectiveness of the cooling system can be assessed. Throughout this process, load banks can be strategically relocated to specific areas to evaluate the local performance of the HVAC system. The networking of these load banks allows for centralized control, operated conveniently from a single hand-held device, optimizing operator efficiency, and ensuring consistent load application. Operators have the flexibility to adjust the operation of individual load banks to create targeted hot spots as necessary.

UNINTERRUPTIBLE POWER SUPPLIES (UPS)

At its most basic level, a UPS comprises enclosed battery packs that automatically deliver power to loads in the event of a power failure. UPS systems prove particularly valuable in supplying power during the initial stages of an outage until the facility's backup power generation system can provide acceptable power. Although a UPS may only need to operate for a brief duration, the seamless transition of power sources is vital for the uninterrupted functioning of downstream IT loads.

Load testing serves to validate the proper operation and performance of a UPS system. Utilizing one or more load banks, batteries are discharged in accordance with manufacturer specifications, assessing their capability to supply the required power. Additionally, the electrical performance of UPS inverters and distribution equipment undergoes evaluation to ensure accurate operation.

Typically integrated into scheduled maintenance programs alongside other backup power sources like diesel generators, UPS systems are commonly tested using resistive load banks.

ELECTRICAL SUBSTATIONS

Ensuring the reliability and sufficiency of power supplied to a data center from a substation is essential to meet the demands of IT power. Load banks are a standard tool in testing substations to confirm their capacity to deliver rated power and to validate the performance of relays and meters. Additionally, load banks can be employed alongside a transformer to assess the medium and high voltage feeds.

POWER DISTRIBUTION UNITS

Power Distribution Units (PDUs), when rack-mounted, play a pivotal role in controlling and monitoring power to servers, switches, and other devices. During the commissioning process, resistive load banks are frequently employed to test PDUs and validate their proper operation. Given that PDUs are often sized between 100 to 300kVA, mobile castor-mounted load banks are commonly utilized for testing purposes. Portable load banks can be strategically placed at each PDU within the data center hall, allowing for the application of power and continuous monitoring of PDU operation. Conducting load tests on PDUs proves to be a cost-effective method, ensuring that multiple racks receive the necessary power for downstream equipment.

REMOTE POWER PANELS

Remote Power Panels (RPPs) work in tandem with PDUs. Functioning as a distinct enclosure, an RPP facilitates a sub-feed from a PDU to connect to a distribution panel that, in turn, supplies power to load equipment. The use of an RPP offers the flexibility of siting PDUs in separate rooms and accommodates the use of larger PDUs equipped with sub-feed breakers. Load banks are routinely employed in commissioning RPPs to verify their proper operation and to ensure the effective distribution of power from the PDU to the rack systems.

BUS TRACKS

The adoption of bus track power distribution is increasing in data centers, providing enhanced flexibility and adaptability to accommodate growing power densities. Load banks are employed to assess the efficiency of bus track power units, feed tracks, and tap-offs, ensuring their optimal operation.

CONCLUSION

Data centers play a crucial role in delivering essential services that heavily depend on a consistent supply of electrical power. As the continuous availability of power is paramount for reliable services, verifying the capabilities of power and cooling systems becomes a key aspect in ensuring service continuity. Therefore, load banks are employed for the commissioning, expansion, maintenance, and testing of power and HVAC systems, including replacement equipment to ensure data center success.

Robert Trefz is Vice President of Marketing at Avtron Power Solutions.
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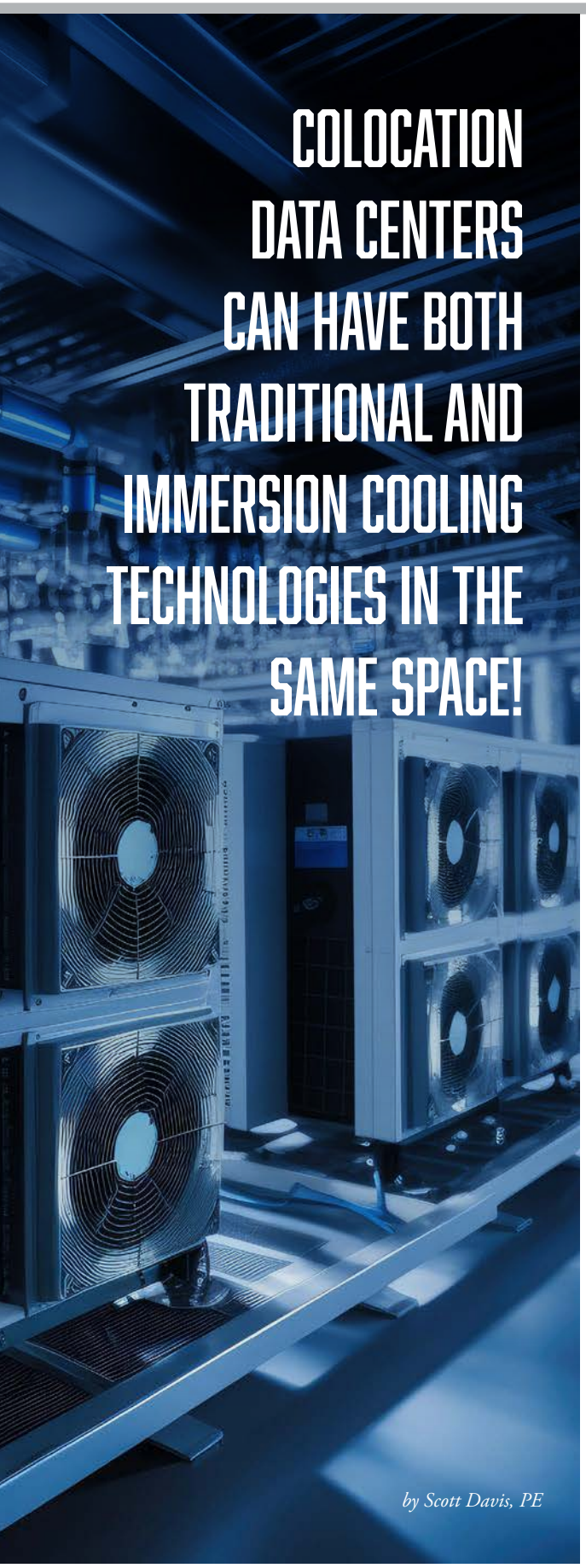

COLOCATION DATA CENTERS CAN HAVE BOTH TRADITIONAL AND IMMERSION COOLING TECHNOLOGIES IN THE SAME SPACE!

by Scott Davis, PE

In early September 2023, Forbes reported that AI and liquid cooling are the future of data center development. While at nearly the same time Fortune mentioned that AI fueled a 34% increase in Microsoft's water consumption at their AI data center in Iowa and now citizens are concerned about the effect on the residential supply of water. Clearly, finding solutions for more efficient and effective cooling for data centers is quickly growing from an "inside industry" issue to one that is making its way to Main Street.

Colocation data center providers have been supplying the market with the space for their data-driven needs using traditional methods, such as air-cooled chillers, to cool vertical rack systems down to 67 degrees F. In some circumstances even down to 50 degrees F to avoid hot spots from a high density of server racks with intense computing power. Given the heat that the equipment is generating, 130+ degrees F, this takes a great deal of energy to lower the spaces to optimal operating temperatures.

With immersion cooling, which places components side-by-side in a sealed cabinet and then submerges them in a liquid substance (generally mineral oil-based), cooling temperatures can be maintained at a much higher levels – over 100 degrees F in some cases. Heat is directly transferred into the cooling fluid as opposed to being transferred into air which is then transferred into a cooling fluid. So, if the temperature of the liquid when it passed over the equipment raises to 130 degrees when it goes to the chiller or fluid cooler, it only has 27-30 degrees to drop versus room air cooled methods that must reduce it 60 degrees or more. The cost savings are immense – it can reduce data center operating costs by more than 90% and capital expenses by more than 50%[1] . Additionally, since the fluid is much more effective at conducting heat than air, it requires less space for distribution within the white space, which allows for greater space to accommodate these high power servers.

Why isn't everyone using it? While immersion cooling is not particularly new – most current applications trace back to start-ups from 2017[2], it is still considered to be in the early adopter phase. Most use has been from big tech companies, or hyper-scalers, who are building their own massive data centers like Amazon Web Services (AWS), Microsoft Azure and Google Cloud who have the funding to explore alternative technologies for cooling and space conservation.

Now, with the explosion of AI in niche markets and analysts predicting that "the technology will be mainstream within the next four years – growing from $251 million in 2021 to over $1.6 Billion by 2027"[3], colocation providers can see that the shift is coming. Many are already starting to see demand for alternative cooling methods, especially as load density increases (+50kW per cabinet). Forward thinking developers are looking at their spaces to understand if they can create a hybrid environment that allows them to provide immersion technologies alongside legacy technologies, without

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having to replace their entire operation. The short answer is they can, with the proper analysis of current capacities and infrastructure, and development of tailored designs specifically for dual cooling capabilities with provisions for conversion and scale up in the future to accommodate these new technologies.

Practical Considerations for Creating a Hybrid Data Center Space may include:

1. **Hybrid Cooling Plants:** Scalable plants that utilize a combination of fluid coolers and chillers.
   a. Fluid coolers and chillers are piped together. The main cooling loop would reject heat through the fluid coolers utilizing chillers to inject cooler water as needed to maintain required supply distribution temperatures. Under this arrangement, thermal efficiency is sacrificed to minimize initial costs and to maximize flexibility.
   b. Fluid coolers and chillers operate in separate cooling distribution loops to allow each to operate at the desired fluid temperatures. This arrangement maximizes thermal efficiency, minimizing operational costs, but requires greater upfront costs to install.
   c. Fluid coolers may be selected as dry coolers since they will operate at higher temperatures and will experience additional free cooling hours. However, if non-potable water is available and inexpensive, then the fluid coolers may be selected as a hybrid type that allows for the implementation of evaporative cooling when ambient temperatures are at peak levels.
2. **Flexible Distribution Loops:**
   a. Multiple, dedicated piping loops are combined at the plant level to distribute cooling water at two different temperatures – one set for lower temperatures associated with traditional legacy equipment and one for equipment that will operate at higher temperatures.
   b. Segregated piping systems with one for equipment served by lower water temperatures and one for higher temperatures.
   c. If a segregated loop approach is used, strategically placed isolated cross ties could be employed to allow for future operation as a single system when spaces are developed or converted for immersion cooling applications.
   d. Localized heat exchangers and pumps are utilized to transfer heat between the plant cooling water and the immersion cooling fluid.
   e. To minimize costs it is recommended that specific areas be initially identified as high density, immersion cooling spaces in an effort to minimize the expanse of the distribution loop(s) required on Day 1.
3. **Flexible White Space:**
   a. Eliminate raised floors. Develop cooling, power and communication systems designs based on a non-raised floor to accommodate the heavier, dense structural loads associated with immersion cooling technologies. Eliminating the raised floor avoids the necessity of strengthening it for future immersion cooling equipment weights that may or may not be deployed in a given white space, while also reducing the cost to install a raised floor.
   b. Plan dedicated space for localized heat exchangers and pumps that are required for immersion cooling systems. These may be located within dedicated CRAH unit galleries adjacent to white spaces or within the white space itself. If placed within CRAH galleries, the design should accommodate the phasing from legacy cooling to immersion cooling as it may be necessary to remove and redeploy CRAH units to other white spaces to accommodate the localized heat exchangers and pumps.

Profit margins for Colocation developers are currently being heavily impacted by large cloud providers who "do it all" and by providing the option of immersion cooling to tenants they will be able to charge a premium for a portion of their available space, without displacing current tenants who do not have that need … yet. As the demand for immersion cooling options grow, they can expand that space footprint to accommodate new installations and eventually convert fully if the need dictates. Meanwhile, they will also have a marketing advantage with prospective tenants to show they are staying on the cutting edge of data center development. When considering this option, it is important to engage engineers who are fluent in the considerations for a hybrid data center to achieve a successful transition of the facility.

As the demand for more efficient cooling systems continues to grow as a result of higher load densities to support AI, immersion cooling technologies will become more prevalent and cost effective resulting in more deployments by a wider range of colocation developers and enterprise data centers throughout the industry.

(1)"How Immersion Cooling is Changing Data Center Density and Design" – Bill Kleyman – Data Center Frontier – 6/27/2023
(2)"The Immersion Cooling Technology: Current and Future Development in Energy Saving" – Nugroho Agung Pambudi, Alfan Sarifundin, Ridho Ahfan Firdaus, Desite Damily Ulfa, Indra Mamad Gandidi, Rahmat Romadhon – 2/26/2022
(3)"AI, Liquid Cooling and the Date Center of the Future" – Holland Barry – Forbes – 9/11/2023

Scott Davis, PE is VP & Director of Mechanical Engineering at Bala Consulting Engineers, Inc.
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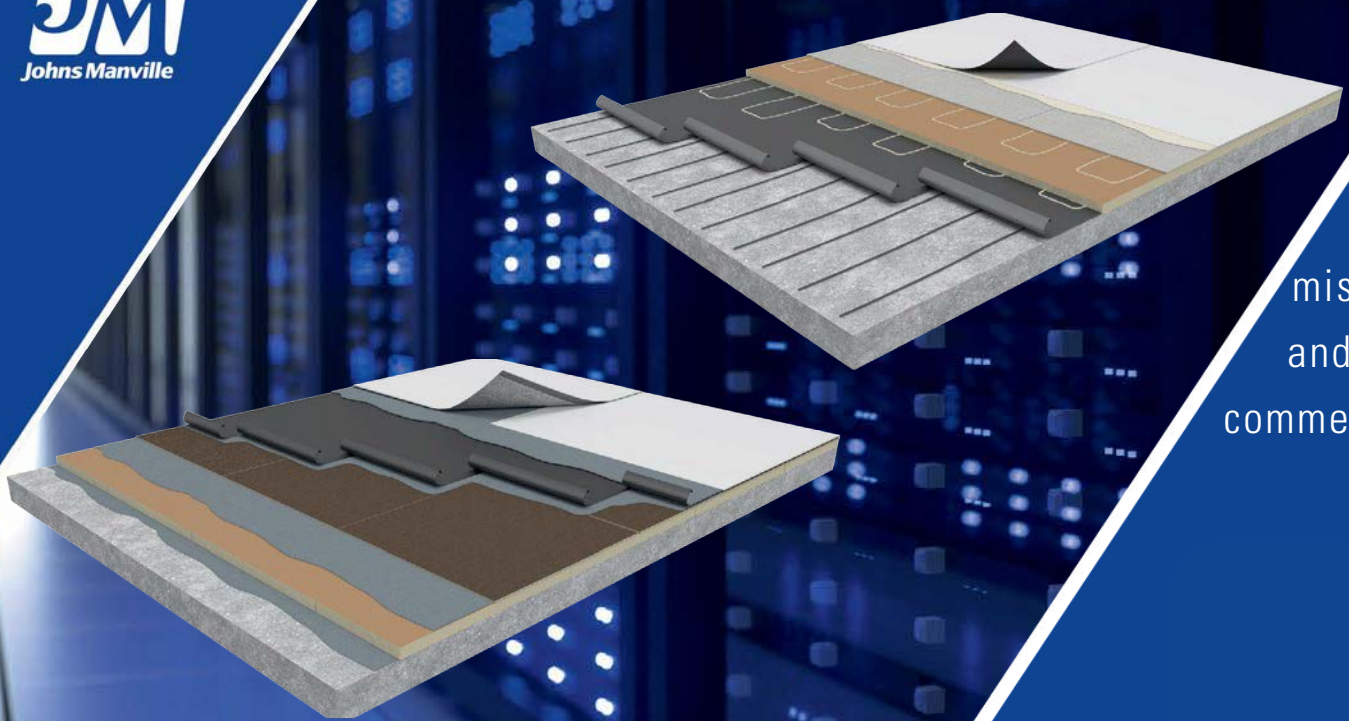

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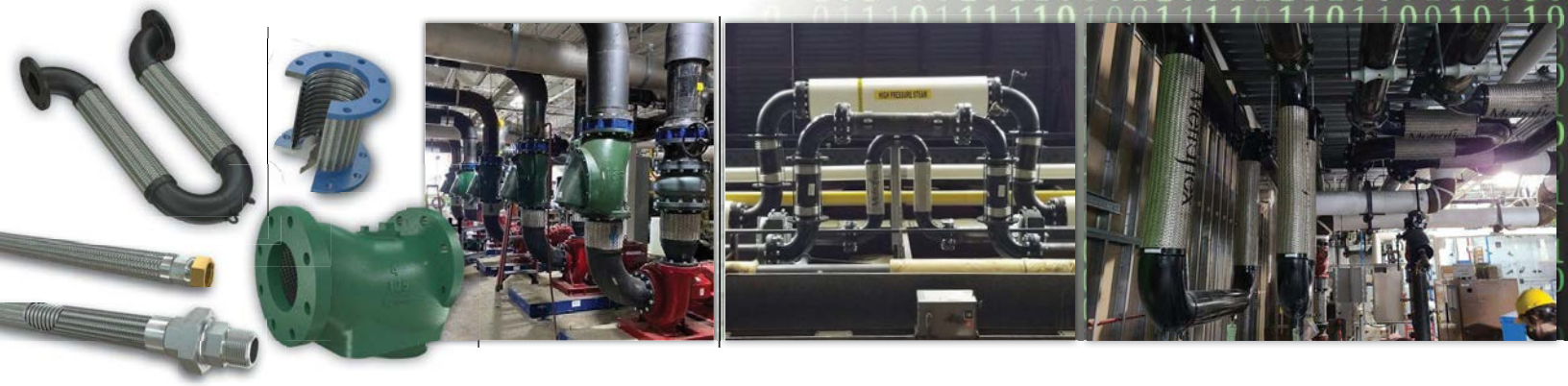

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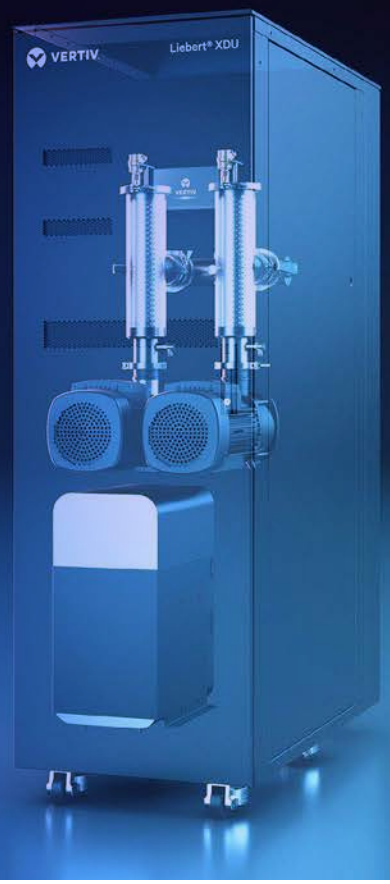

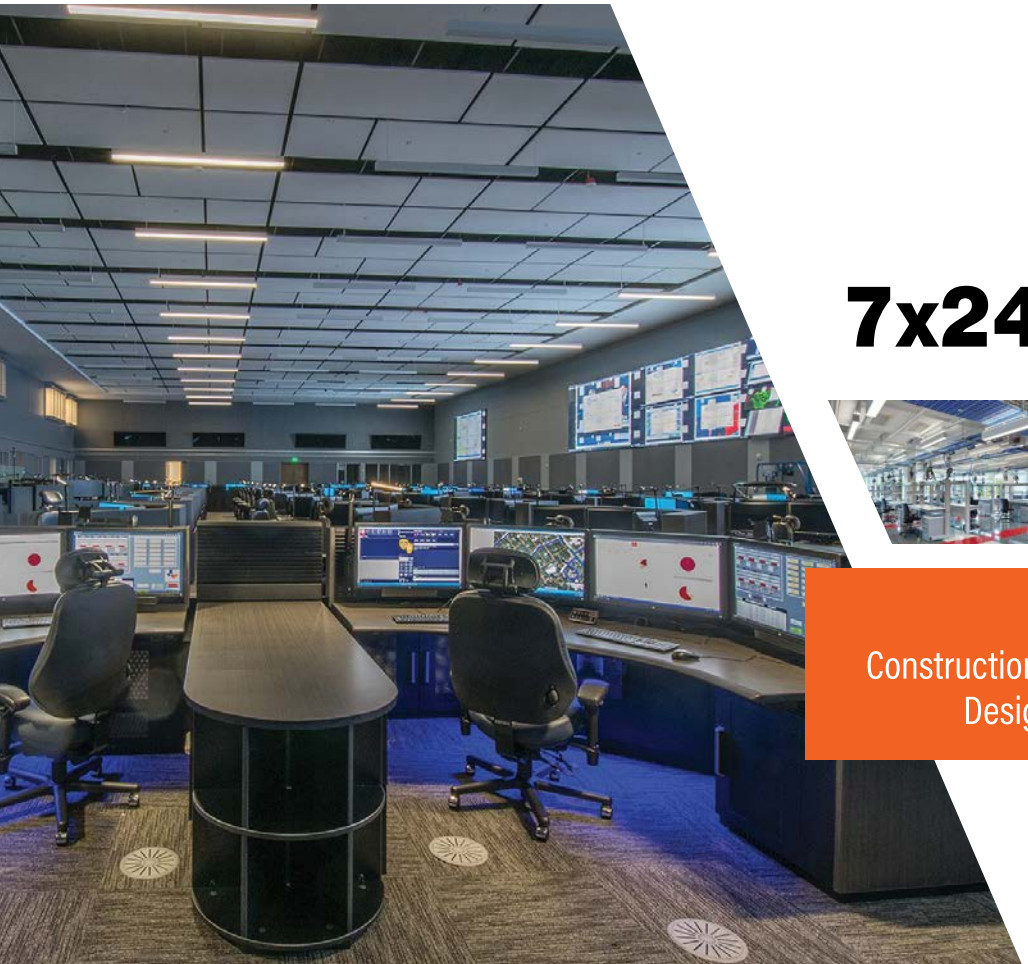

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Jack Kass, former head of Go-to-Market at OpenAI, futurist and visionary, will kick off the conference with a keynote address on the topic **"Leveraging AI for Good: AI's Potential to Redefine Productivity and Reinvent Employee Satisfaction".**

Zack explores the intersection of cutting-edge AI advancements and their practical applications in the business landscape. Delve into the current state of AI, its trajectory, and discover how different industries are harnessing this technology to revolutionize efficiency, liberate employees from burnout inducing tasks, and transform work as we know it. Drawing on his years of expertise linking AI advancements to solve bottlenecks at work, Zack presents an inspiring vision of an AI-enhanced future and offers practical, actionable strategies to ensure your organization is equipped to leverage AI for the benefit of your people.

Our second conference day will open with a Keynote **"Going Clean – A Look at the Future of Data Center Power"** by Phill Lawson-Shanks, Chief Innovation and Technology Officer, Aligned Data Centers.

The closing keynote **"Prioritizing Highly Evolved Infrastructure and Fully Optimized Operations, Are You Ready?"** will be delivered by Ron Davis, Vice President, Digital Infrastructure Operations, Uptime Institute.

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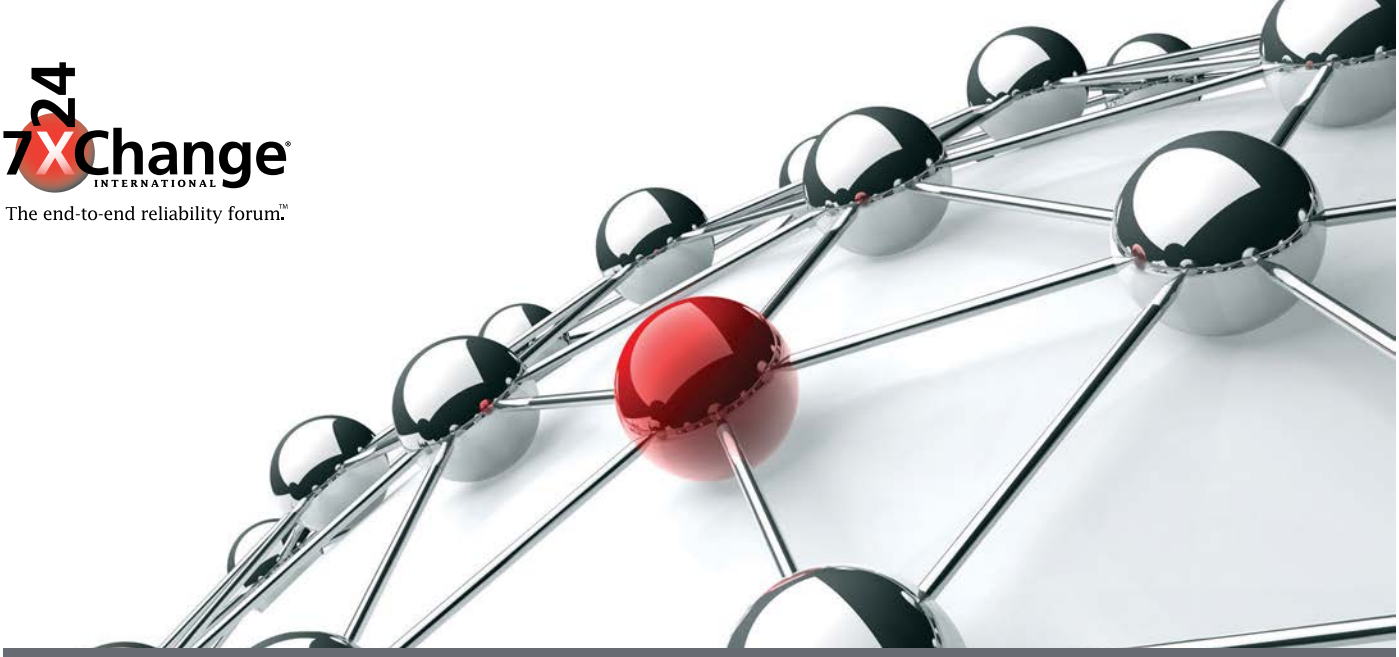

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The 7x24 Exchange Mentoring Program is the **industry-leading** next generation **mission critical mentoring program**, providing **students** and **early career professionals** with opportunities to receive **meaningful career guidance** from today's **practicing industry professionals**.

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7x24 Exchange INTERNATIONAL
The end-to-end reliability forum.™

INTERNATIONAL DATA CENTER DAY
Powered by 7x24 Exchange International

2024 INTERNATIONAL DATA CENTER DAY RECAP

March 20, 2024, marked the celebration of the 6th International Data Center Day. Launched in the fall of 2019, International Data Center Day is designed to create awareness of the data center industry and to inspire the next generation of talent. It provides the industry with an opportunity to open its doors and show, in a collaborative effort, what data centers are, why they are so important to our connected world, and the wide array of career opportunities that are part of the data center industry.

EVERY DAY IS DATA CENTER DAY

Although this year's celebration was held March 20, the organization encourages those in the mission critical industry to engage in raising awareness of the industry year-round.

Listen to The Thought Cloud Here

THE KICKOFF

This year, we kicked off the initiative with Amy Al-Katib of Mission Critical Magazine interviewing 7×24 Exchange's Chairman & CEO, Bob Cassiliano, and 7×24 Exchange's Greater Washington DC Chapter President, Karen Petersburg, about the evolution of International Data Center Day, the NEW Resource Toolkit, the Cloud Run, Adopt a School, and easy ways the industry can participate in person and virtually.

Bob Cassiliano

Karen Petersburg

THE NEW RESOURCE TOOLKIT

A brand-new resource toolkit was created to provide an assortment of resources for individuals and companies to use in their International Data Center Day initiatives. The resources include logos, social media imagery, web badges & banners, posters, planning guides and educational resources.

Check Out the Resource Toolkit...

THIS YEAR'S THEME: ADOPT A SCHOOL

In 2024, the theme of Adopt a School encourages data center operators to "adopt" a local area school and share the wonders of the mission critical industry.

The premise – If each mission critical organization adopts a school, imagine how many students might consider a career in the mission critical field.

Numerous companies in the data center space enthusiastically participated in the initiative.

Learn More Here...

ADOPT A SCHOOL PARTICIPATION

There was overwhelming support for the 2024 initiative. Here are just a handful of examples.

Cummins adopted three schools – Fridley High School, Northwest Metro 916, and Guilsborough Academy in the UK.

7×24 Exchange Silicon Prairie Chapter, JE Dunn, Meta, and Turner Construction hosted students from Omaha Public Schools interested in careers in the Mission Critical space.

Celina Berglund, CEO of **BROGAV Solutions**, visited a local elementary school where she read Carrie Goetz' children's book, "Polly Packet's Precious Payload", sparking conversation around data centers.

The **7×24 Exchange Atlanta Chapter WiMCO Community** had a tour of the QTS Data Centers ATL-DC2 facility.

Netrality hosted an event for high school students at 401 N. Broad St. in Philadelphia, on March 20th.

eStruxture Data Centers opened their doors to students at their MTL-2 facility.

Adobe hosted a visit by the Forest Grove High School Advanced Mechatronics class to the Adobe OR1 Data Center.

ESI Total Fuel Management presented to the Academies of Loudoun in Loudoun County Virginia.

The **7x24 Exchange Metro NY Chapter** presented to Fontbonne High School in Brooklyn, NY, to increase awareness of the data center industry.

TAS Energy Inc.'s engineering team presented to a group of third through fifth grade students at Hartsfield Elementary Magnet School in Houston, TX.

Sabey Data Centers in Tukwila hosted 30 High School students from across the Northshore and Tukwila School Districts.

DPR Construction's Newport Beach location presented on data centers to Foothill High School in Santa Ana, CA.

Students from Fridley High School.

Celina Berglund, CEO of BROGAV Solutions visiting a school

Metro New York Chapter donates to Fontbonne High School

International Data Center Day swag.

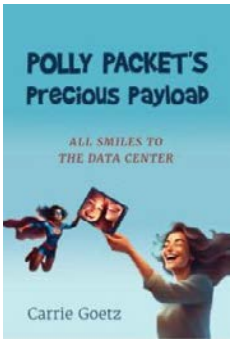
Participants from Guilsborough Academy.

BOOKS!

Our data center friends have published new books that provide children with fun and easy-to-understand descriptions of how data centers operate and how data center technology works.

Adventures in the Cloud World eBook
Published by Digital Realty

What is a Data Center? eBook
Published by Eaton



Polly Packet's Precious Payload
Written by Carrie Goetz

Visit the books...

THE CAREER TREE CONTINUES TO GROW

Visitors who use the career tree can learn from industry professionals about different career paths within the mission critical industry. With four "branches" containing well over 20 "leaves", users can watch video interviews from sales and marketing, operations, design, and information technology professionals.

We encourage data center professionals to help us grow and nurture the Interactive Career Tree by volunteering for interviews to be featured there.

View the Interactive Career Tree

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SUPPORT US ON SOCIAL MEDIA

This year, there were hundreds of social media posts showing support for the International Data Center Day celebration. Be sure to post your photos, videos, and other activities. Tag us using #intldatacenterday.

Check Out the Resource Toolkit...

Stay Informed
Join Us on LinkedIn, X, YouTube... and now, Facebook!

As 7x24 Exchange International prepares for numerous events including the 7x24 Exchange Spring Conference in Orlando, FL, STEM activities, Chapter events, and more, we'd like to invite you to follow us on our social media platforms.

facebook

LinkedIn

YouTube

For information about sponsoring an event or for more detailed information not available at www.7x24exchange.org, please contact us at info@7x24exchange.org or (646) 486-3818.
7x24 Exchange International – P.O. Box 61360, Staten Island, NY 10306

Thank You!

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