How a new Data Center Alliance could steer the future of digital sustainability

Content

Introduction

Data center providers are continually challenged with balancing the need to meet urgent infrastructure demand with the need to contain power usage and emissions. This challenge has become increasingly critical in the wake of the burgeoning demand for digital access and increasingly AI-centric technologies. The current wave of AI adoption across industries has led to an unprecedented surge in data processing and storage requirements, placing additional pressure on data centers. AI's computational intensity not only escalates power consumption but also amplifies the urgency for sustainable solutions in data center operations.

But data center providers can't achieve this in a silo. It's going to take an ecosystem approach. The integration of AI into various sectors – from healthcare to finance, and from retail to manufacturing – underscores the need for a holistic strategy in data center sustainability. This is not just about meeting the immediate demands; it's about preparing for a future where is ubiquitous.

Ultimately, the growth impact of data centers extends into and beyond the racks, into the industries and stakeholders that data centers serve. With these things in mind, this ebook will propose that the path forward hinges on a renewed data center ecosystem able to collaboratively make concessions, align on mutual goals, and take joint action, leveraging each other's strengths and capabilities to drive more robust advocacy.

To this extent, we'll unpack some overlapping considerations facing those supporting that evolution in ways that balance the complex factors. The role of AI in this evolution cannot be overstated – it is both a driver of demand and a potential part of the solution, offering innovative ways to optimize energy efficiency and reduce emissions in data centers.

> NTT is at the forefront of leading sustainability innovation in the data center industry with a goal of net zero for direct and indirect emissions from its operations for data centers by 2030.

The Data Center Alliance: Who needs a seat at the table?

Power, infrastructure, cooling, hardware; extending digital reach, when and where needed, is a near-miraculous feat of engineering and collaboration between data center ecosystem collaborators.

Doing that sustainably is about doing what's possible now while maintaining a progressive vision for continually implementing forward-thinking strategies in the medium and long term. Part of that means planning and building flexible infrastructure today that's capable of integrating the capacity and sustainability needs of tomorrow.

But who are the players that make up this vital alliance of sustainability stakeholders, and what role do they play?

Combining innovation in power, hardware and infrastructure

The role of power

Power providers are behind key innovations in renewable energy solutions in solar, wind, and hydroelectric that have significantly reduced data centers' reliance on fossil fuels. As the cost of implementation drops further, hyper-modern data center campuses are ramping up renewable energy sources.

The role of infrastructure

Data center providers lead the way in adopting sustainable operational practices. Increasingly, data center infrastructure providers are adopting more flexible data center designs to sustain the efficient use of resources and minimize environmental impact.

The role of hardware

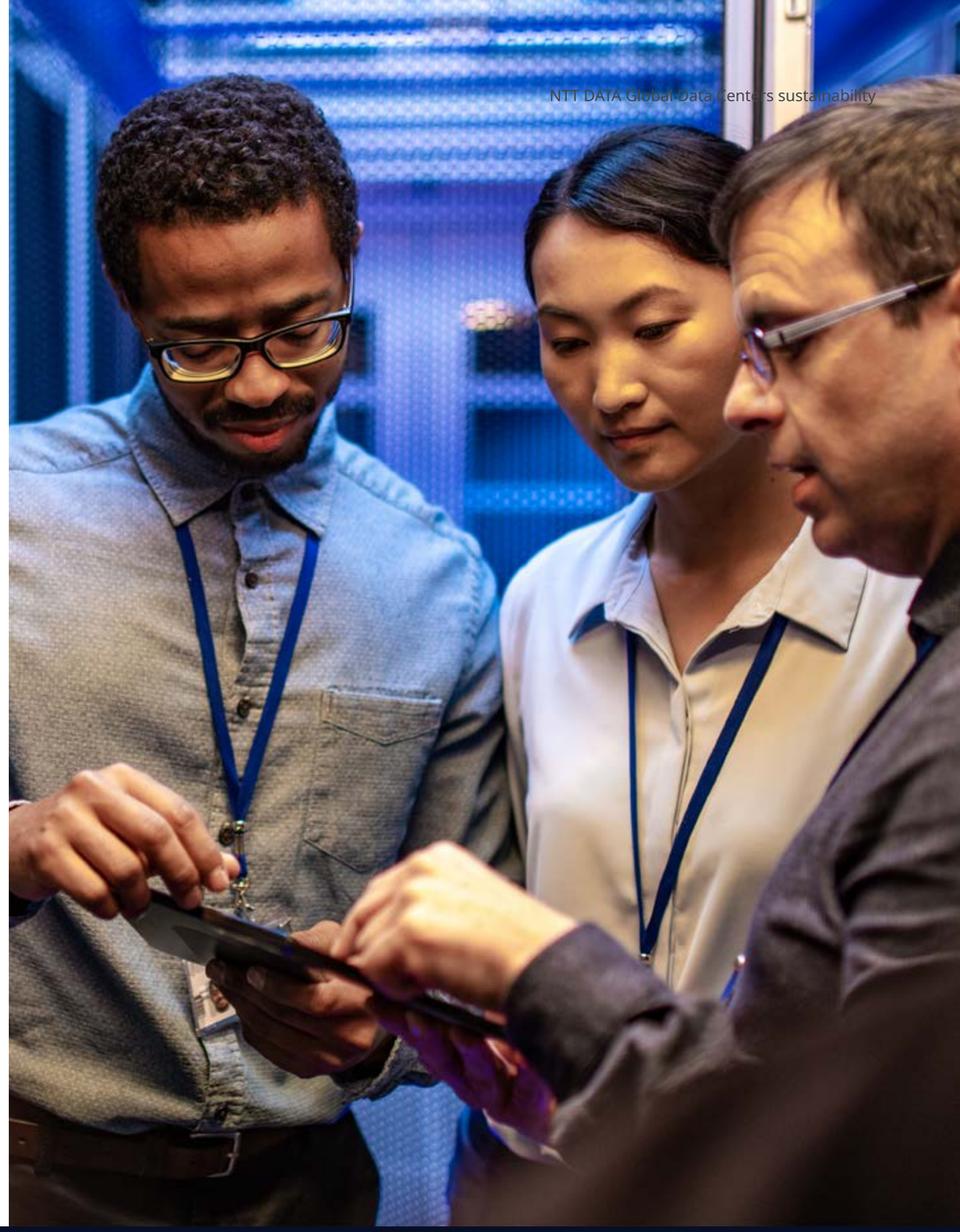
Beyond the rack, hardware manufacturers are tasked with pushing the envelope of R&D and technical ingenuity in pursuit of ever-greater energy efficiency across servers, storage systems, and network equipment.

The role of data center customers

Data center customers, including hyperscalers and enterprises, are crucial in the future for furthering sustainability innovations in data center operations. As champions in practice and investments, they can help push the industry towards eco-friendly practices by requiring sustainability practices and co-investing in green energy technology.

The role of public policymakers

The role of public policymakers is increasingly pivotal in shaping the sustainable future of data centers. These stakeholders are responsible for creating and enforcing regulations and policies that encourage or mandate using renewable energy and sustainable practices within the data center industry.



Challenges faced in forging a Data Center Alliance?

Data center infrastructure providers, hyperscalers, and enterprises collaborate continuously as part of a data center ecosystem that addresses critical growth and sustainability challenges. As a closer alliance, how can we refocus engagements and amplify the impact on our key challenges to clear the remaining roadblocks that line the path toward sustainable data center expansion?

Diverse stakeholders

Data center ecosystems are complex arrangements of architects, operators, vendors, and end-users. Each brings a distinct perspective and set of priorities to the table. While this diversity can ignite innovation, it can also challenge setting unified approaches.

Regulatory confusion

Data center growth requires combining a global outlook with local awareness to adhere to regional and national regulations to remain viable. These regulations can be misaligned or even contradictory, making it challenging for data centers to adopt uniform approaches to sustainability.

In Europe, new regulations are emerging rapidly, affecting every industry, including the Corporate Social Responsibility Directive (CSRD), which requires companies to report on the environment-related risks they face.

Although regulation is ultimately a well-intentioned positive in the long term, a sudden abundance of heavy legislature in the short term risks causing confusion and subsequent delays in providing critical data center infrastructure where it’s required.

Key challenges (continued)

Uneven investment across the industry

The boom in data center demand has attracted investor attention of every kind. But, despite investment activity showing positive signs in areas such as cutting-edge liquid cooling solutions, as McKinsey Insights points out, not all data center stakeholders are investing equally, and "infrastructure investments are still far from the mainstream, leaving considerable untapped potential."

Technical diversity

Data centers around the world use a myriad of technologies, architectures, and solutions. This technical heterogeneity makes it difficult to propagate a single best practice or innovation across the entire industry.

For a newly focused data center alliance, embracing this diversity — while championing universally applicable and sustainable solutions — can become critical to an urgent and feasible expansion of new data center architecture.

Energy source limitations

While there's enthusiasm for green energy, the availability and reliability of renewable energy sources can vary significantly by region.

In the US, according to the US Energy Information Administration (EIA), renewable energy sources generated a record 834 billion kilowatt-hours (kWh) of electricity in 2020, accounting for about 21% of all the electricity generated in the country. However, the percentage share of total energy consumption from renewable energy sources was only 8.5% in 2022.

This inconsistency challenges data centers aiming for 100% renewable energy usage. As part of a renewed alliance, more robust, collaborative initiatives between energy providers and data centers can help bridge this gap, fostering a consistent green energy supply.

A unified approach and vision

In navigating the complex terrain of digital sustainability, a new data center alliance must embrace unified approaches and strategies that integrate overlapping imperatives. The sum of that collaborative effort must become more significant than its moving parts.

The path to digital sustainability is not a linear journey but a collaborative one. It requires power providers, data center providers, hardware manufacturers, and data center customers to operate not in silos but as interdependent entities within an ecosystem.

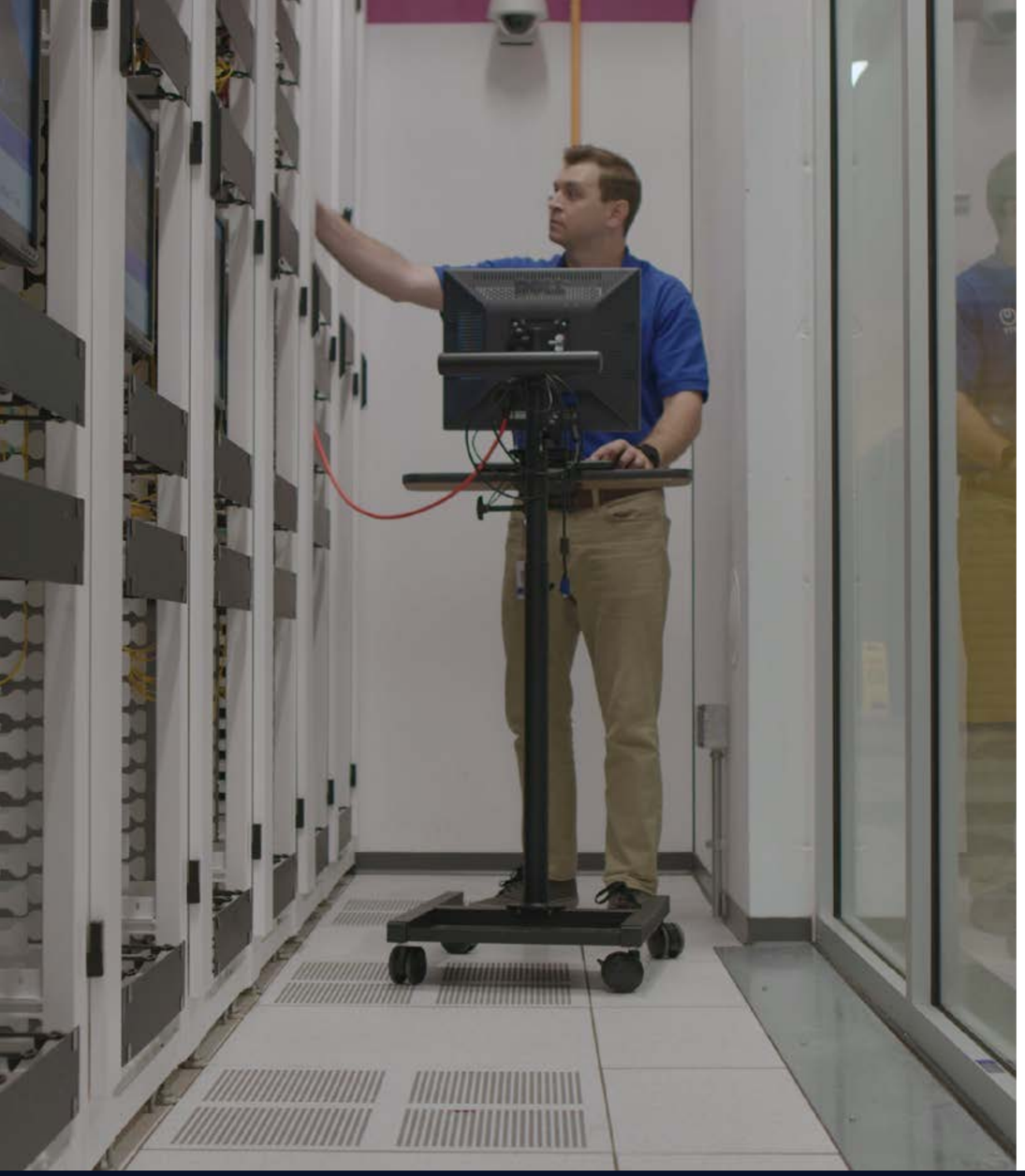
Power and infrastructure

Power providers must tighten close-knit relationships to become the vanguard of widely adopted flexible and sustainable operational practices and pioneer initiatives that set industry-wide standards for sustainability.

By integrating innovative grid technologies, power providers can revolutionize energy management, ensuring a more efficient and reliable supply of power, particularly from renewable sources. This approach not only enhances energy sustainability but also supports the dynamic needs of data centers.

Additionally, the advancement of modular infrastructure design marks a significant stride in sustainable development. These flexible and scalable designs allow for tailored, energy-efficient solutions that adapt to changing demands, minimizing resource waste and maximizing operational efficiency.

For data center investors and executives, the decision to invest in sustainable technologies and renewable energy sources can present a challenging tradeoff between immediate profitability and long-term sustainability. While integrating energy-efficient systems, AI-driven management, and renewable energy like solar and wind power involves significant upfront costs, these investments are crucial for a sustainable future. The long-term benefits—reduced environmental impact, enhanced operational efficiency, and alignment with the rising demand for eco-friendly computing—make it a worthwhile endeavor. This strategic shift is essential for data centers to responsibly meet the evolving digital demands and set new precedents in the industry.



Hardware manufacturers

Hardware manufacturers hold a dual responsibility crucial in the evolution of data centers. They are tasked with innovating at the cutting edge of research and development, focusing on energy-efficient technologies that redefine the benchmarks of hardware performance.

This pursuit of innovation is about advancing technology and ensuring that these advancements align seamlessly with the practical operational realities of data centers. It's a delicate balance between pushing the frontiers of what's possible and maintaining compatibility with existing infrastructures.

To achieve this, hardware manufacturers must ensure that their products offer improved energy efficiency and integrate effectively with the diverse environments of modern data centers. This includes addressing critical sources of heat and power consumption and ensuring that new hardware can be incorporated without disrupting the existing systems.

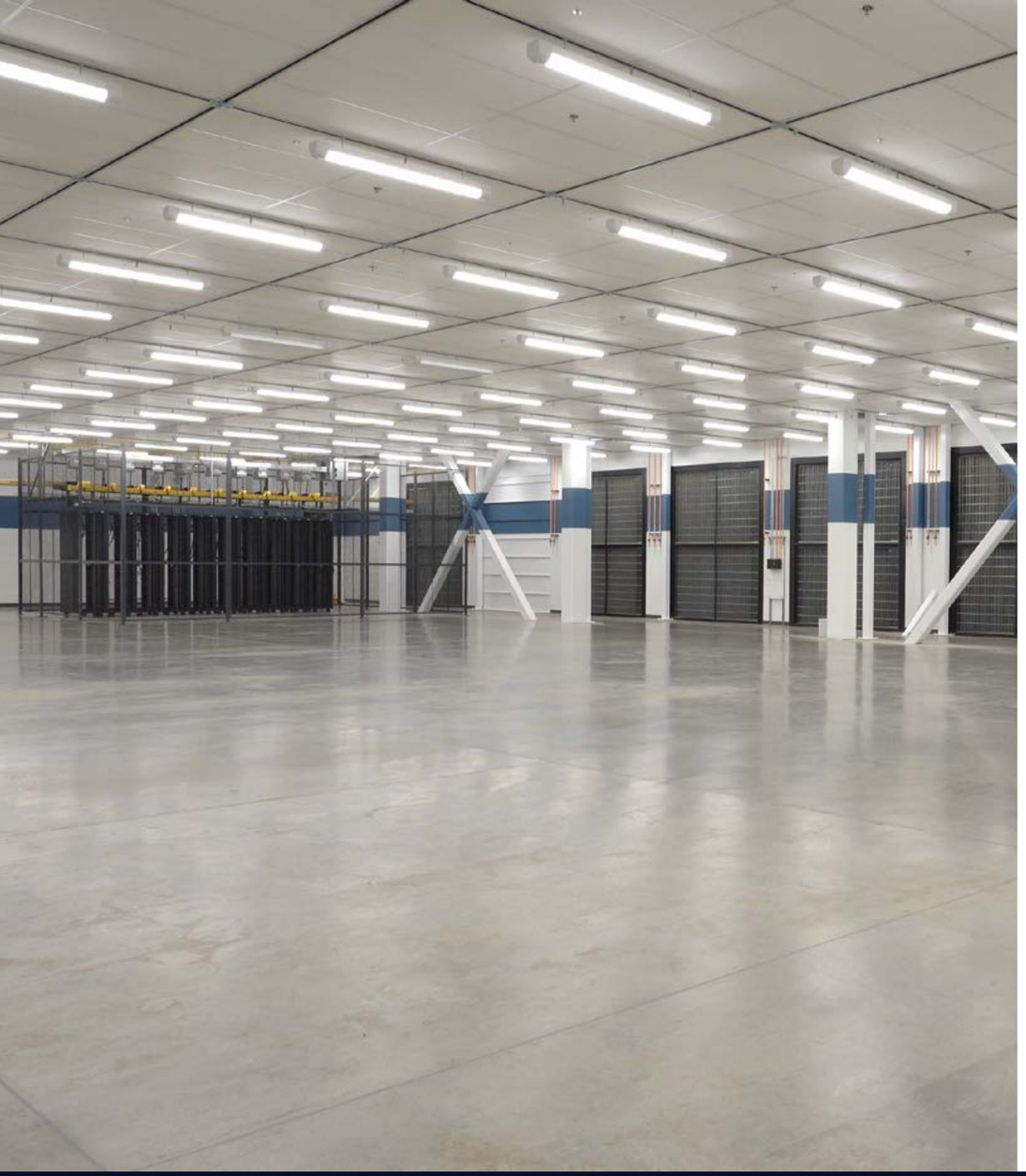
The dynamic nature of their advancements needs to complement the infrastructural flexibility championed by data center providers. Hardware manufacturers play a pivotal role in creating a harmonious ecosystem where hardware innovation goes hand-in-hand with sustainable and practical data center operations.

Data center customers

Data center customers are pivotal in shaping the sustainable future of data centers. Their demand for renewable energy sources and investment in green technologies set new standards for eco-friendly operations. They encourage the industry to elevate its sustainability practices.

Additionally, their advocacy for policy changes and exploration of innovative cooling solutions, like liquid immersion cooling, demonstrate a forward-thinking approach to reducing the energy footprint of data centers. These customers play a pivotal role, not just as participants but as key drivers. Data center providers should actively collaborate with their customers to enhance the operating efficiency of IT equipment.

By working together to adopt advanced technologies, they can significantly reduce energy consumption and environmental impact. This collaborative effort leads the industry towards a more responsible and environmentally conscious future.



Public policy advocates

Public policy advocates and Policymakers can be instrumental in creating the regulatory framework that guides the sustainable evolution of data centers. Their role involves crafting policies and regulations that encourage the adoption of green technologies and sustainable practices within the industry.

Setting standards for energy efficiency, renewable energy use, and carbon emissions can significantly influence the direction and pace of sustainability efforts in data centers.

Moreover, these stakeholders have the power to incentivize innovation through grants, tax benefits, and other supportive measures, encouraging both data center operators and their clients to invest in eco-friendly solutions. They can also facilitate collaborations between government, industry, and academia to foster research and development in sustainable technologies.

Through their legislative and regulatory actions, Public Policy Advocates and Policymakers ensure that data centers operate within an environmentally responsible framework and drive the industry toward a more sustainable and green future. Their decisions and initiatives are crucial to aligning technological advancements with environmental stewardship and energy efficiency goals.

Charting a sustainable path in data center operations

In the future of data center sustainability, it's evident that a collaborative approach is critical. Each stakeholder, from power and infrastructure providers to hardware manufacturers, plays a crucial role in this ecosystem.

The stakeholders and actions discussed in this ebook aren't just aspirational goals; they're firmly rooted in a realistic reality of actionable strategies designed to continue our industry's commitment to a greener world.

The collective journey towards a greener, more resilient, and resource-efficient future is not just a responsibility—it's an opportunity for data centers to lead by example, demonstrating the power of unity and foresight in forging a sustainable path for the technology sector and beyond.

About Global Data Centers

Global Data Centers is a division of NTT Ltd. Our global platform is one of the largest in the world, spanning more than 20 countries and regions, including the Americas, Asia Pacific, EMEA and India. NTT DATA is routinely recognized as a Leader by leading networking and data center analysts.

As a neutral operator, we offer access to multiple cloud providers, a large variety of internet exchanges and telecommunication network providers including our own IPv6-compliant Tier 1 Global IP Network. Clients benefit from tailored infrastructure and experience consistent best practices in design and operations across all of our reliable, scalable and customizable data centers.

NTT DATA has made a net-zero commitment in alignment with the science-based target initiative across its operations by 2030 and the whole value chain until 2040. In addition, we drive towards powering our data centers with 100% renewable energy by 2030.

Learn more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