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Hybrid Multicloud Deployment Choices Can Increase ROI Via Sustainability Benefits

Dave Pearson
Research Vice President,
Infrastructure Systems, Platforms
and Technologies Group, IDC

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IDC Opinion

Awareness of sustainability within enterprise infrastructure (in the datacenter, at the edge, and in the cloud) has grown significantly in recent years due to a combination of environmental, economic, regulatory, and reputational factors. Also, data-intensive workloads, such as AI and GenAI, have increased energy and cooling demands due to power-hungry GPU-accelerated computing technologies, meaning more efficient infrastructure can free up power and cooling for these high-priority workloads.

The positive contribution to organizations extends beyond environmental concerns; decreasing energy consumption, power and cooling costs, and carbon emissions can have a significant impact on operational efficiency, costs, and ultimately, profitability. Regulatory concerns are adding to sustainability demands and reporting needs, and fees and fines for noncompliance can prove significant and damaging. No longer is sustainability considered a checkbox on marketing materials or a cost center for "green IT" initiatives; rather, it has been shown to have material positive impacts on operational costs and profitability as well as IT infrastructure and resource efficiency.

The shift toward greener practices not only benefits the planet but also enhances operational efficiency and positions organizations to meet the evolving expectations of customers and stakeholders during a time when datacenter and application modernization activities, especially those aimed at new data-intensive workloads such as AI and GenAI, are top priorities for enterprises in every region and industry. These workloads touch on many of the factors and pressures organizations face in their modernization journey — they are typically cloud native, require seamless mobility between multiple cloud and on-premises environments as they move from modelling to tuning to fine-tuning and retrieval-augmented generation (RAG) to inferencing activities, and require massive amounts of data (frequently generated and utilized in edge locations).

Methodology

Two in-depth interviews were conducted by IDC of Nutanix clients that implemented the Nutanix Cloud Clusters (NC2) solution as part of their infrastructure modernization program.

KEY NC2 SUSTAINABILITY OUTCOMES

Power savings:
60%–80%
for both organizations

Rack space savings:
80% for Org1

CO_2 reduction:
199.5 ton/year
for Org2

Participants were asked about their past and present datacenter operating states to determine what sustainability goals they strove to meet by modernizing their infrastructure. They were asked about drivers for sustainability issues; metrics they had to or chose to track; internal and external stakeholders, issues, and roadblocks; and their future outlook for sustainability demands and outcomes. Further, they were asked to describe the non-sustainability outcomes that they experienced through their modernization initiatives and what best practices they learned along the way.

Org1 is a multinational media company with approximately 20,000 employees, supported by hybrid cloud infrastructure that has evolved from purely on-premises resources. The company's public climate action plan states an intent to reduce emissions by 50% over a 12-year period and to achieve net zero by 2030.

Org2 is a European public sector organization supporting over 1,000 employees solely through NC2 on public cloud. After a half decade of utilizing another vendor's on-premises traditional infrastructure, the organization shifted to Nutanix HCI on-premises approximately five years ago, and during its most recent hardware refresh, the organization chose to utilize the public cloud operating model for its Nutanix infrastructure. This organization also has a publicly stated goal to reach net zero, with a target of 2045, five years ahead of its governing body's commitment.

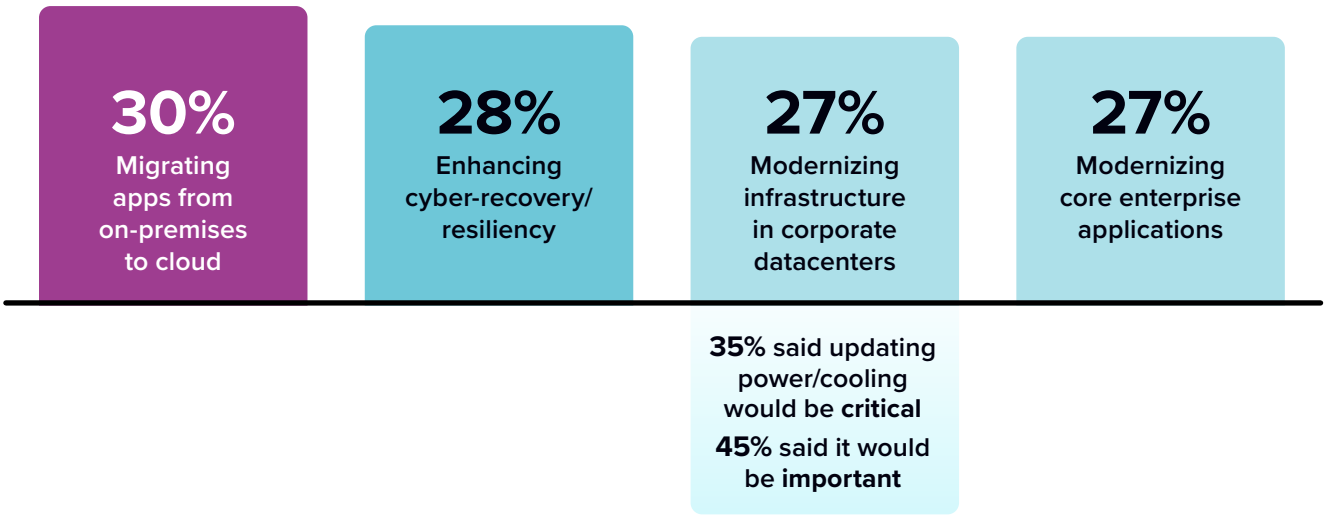
Situation Overview

According to IDC's September 2024 *Future Enterprise Resiliency and Spending (FERS) Survey, Wave 8* (see **Figure 1**, next page), the top areas for increased spending in 2025 include modernizing core enterprise applications and corporate datacenter infrastructure (27% for both) and migrating applications to cloud (30%).

80% of the 483 respondents who expected to invest in modernizing their datacenter infrastructure indicated that **power and cooling were important or critical areas to update to address datacenter needs,** showcasing how important environmental considerations and sustainable operations have become to datacenter modernization and infrastructure purchase decisions.

FIGURE 1

Top Areas for Significant Budget Increases in 2025, Regardless of Overall Budget Plans



n = 891; Source: IDC's *Future Enterprise Resiliency and Spending Survey, Wave 8,* September 2024

Concerns about sustainability/ energy cost/ emissions running AI infrastructure are significantly limiting further development of custom AI apps."

IDC's *Future Enterprise Resiliency and Spending Survey, Wave 1, 2024*

The one-two punch of application and infrastructure modernization, along with increased utilization of public cloud resources and the expansion of infrastructure in edge locations, highlights the need for a deployment paradigm that supports hybrid cloud and hybrid multicloud capabilities. Frictionless mobility between datacenter, edge, and cloud environments requires cloud-native development and cross-enterprise observability and management and demands efficient use of resources — not just compute and storage capacity on premises and in the cloud but also datacenter space, cooling, and power.

Data-intensive applications in particular are bringing sustainability issues to the forefront, considering the power-hungry nature of accelerated compute and the large data volumes required for many modeling and tuning activities. AI and GenAI deployments are worrisome to enterprises, as almost a quarter (23.4%) of IDC's 2024 *FERS Survey, Wave 7* respondents feel that "concerns about sustainability/ energy cost/emissions running AI infrastructure" are significantly limiting further development of custom AI apps in their organization.

Requirements for modern applications change throughout their life cycle, sometimes rapidly, especially as the data sources and repositories exert gravity on each other and their associated compute. Public cloud can be an attractive alternative to an aging and inefficient datacenter, as it can address modernization needs through greater capacity, operational efficiency, and resiliency and drive

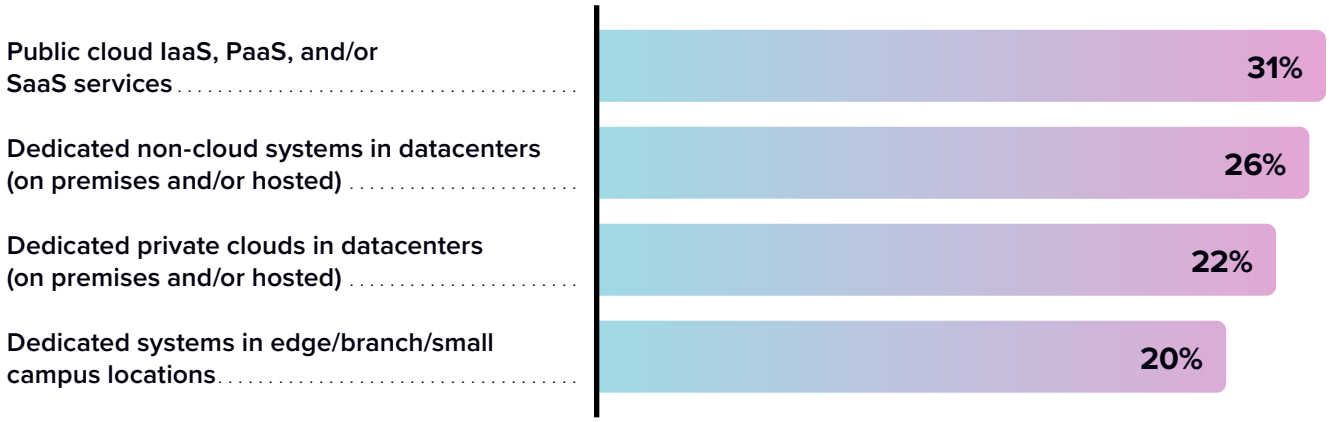
resource efficiencies by bringing data closer to applications as well as meeting cost and sustainability requirements. A platform that supports applications in the same consistent manner, no matter where they reside, gives enterprises the flexibility to pick the right environment at the right time without time-consuming and costly rewriting, refactoring, or replatforming their application portfolio (see **Figure 2**).

FIGURE 2

Key Area for Increased Spending in 2025

(Percentage of respondents)

What is your best estimate of where your organization will deploy production GenAI workloads and data across the digital infrastructure deployment options shown below over the next 18 months?



n = 881; Source: IDC's *Future Enterprise Resiliency and Spending Survey, Wave 8*, September 2024

Frictionless application mobility from on-premises infrastructure to public cloud, between clouds, and repatriation back to on-premises dedicated hardware addresses several other key considerations during modernization efforts, including:

- **Uncertain demand**
  The ability to burst to cloud as needed to address issues with performance and scale of applications as organizations' needs change and grow or organizations revert to on-premises infrastructure if future demands are more regular or limited can prevent wasteful overprovisioning in either environment.

- **Need to repatriate**
  A variety of reasons may force organizations to return from public cloud environments to on-premises, not just scale and cost. Regulatory compliance, data sovereignty, privacy, security, governance rules, and protection of competitive data are all key reasons IDC survey respondents have indicated may lead to repatriation of data and workloads to their own infrastructure.

- **Resilience and disaster recovery (DR)**
  Rather than operate multiple sets of redundant infrastructure, organizations can utilize available cloud resources when needed for DR, even using multiple clouds for surety against rare but painful hyperscaler outages. This is an added sustainability bonus as well — redundant infrastructure multiplies power, cooling, and CO_2 operational effects, not to mention the environmental impact of the manufacturing and disposal of the hardware itself. eWaste in the form of redundant infrastructure can be greatly reduced by utilizing cloud-based DR.

Respondents' Considerations

> **"... we went with Nutanix because we didn't really understand what was going to come across in the migration, and the hyperconverged stack of Nutanix makes it very easy to deploy and migrate."**
>
> Senior Digital Infrastructure Manager, Public Sector

Org1 faced a combination of challenges with its existing on-premises infrastructure — legacy infrastructure that used an inordinate amount of space, power, and cooling, creating a great deal of CO_2 emissions without the corresponding performance, flexibility, resilience, or ability to support modernization activities with reasonable return on investment. Business continuity and disaster recovery was a major consideration for it, but even more importantly, application modernization was a primary driver as it sought to continue its journey toward being a digital-first organization.

Org2 was slightly better positioned to take advantage of NC2 in the public cloud, as it was already using Nutanix HCI on premises and was facing a hardware refresh, giving it the ability to explore options on premises, at the edge, and in public cloud with a consistent deployment, migration, and management experience, mitigating the skills gap that many organizations face during modernization activities.

Embracing Sustainable Infrastructure

Org1 Benefits Achieved

This global media company successfully reduced floor and rack space in two key multi-petabyte datacenters while also migrating environments from EMEA and North American operations to these facilities.

Consolidating and simplifying operations and disaster recovery were crucial for this organization, but the sustainability benefits that came about because of this transformation were also significant and appealing. 72 racks (36 at each facility) were reduced to a combined 14 while providing capacity to migrate environments and additional VMs from other geographies, greater performance, and improved DR capabilities through utilizing public cloud.

At the same time, power consumption was reduced by 73% at the primary site and just over 80% at the secondary. With increasing power costs due to supply and demand dynamics, environmental regulations, geopolitical events, and sensitivity to extreme weather events, IDC estimates that power and cooling now accounts for, on average, 46.3% of the annual operating budget for corporate datacenters, meaning this reduction for Org1 represents significant cost savings to the firm.

> **Rack space across two key datacenters was reduced by 80%. Power consumption was reduced by over 75% in total and over 80% at the DR site."**
>
> Global Datacenter Operations Manager, Media and Publishing

Org2 Benefits Achieved

This public sector organization has both a mandate from its governing body and a deep connection to sustainability issues due to the areas in which it works.

[Power consumption savings] worked out at 60.3%. We're delighted with that."

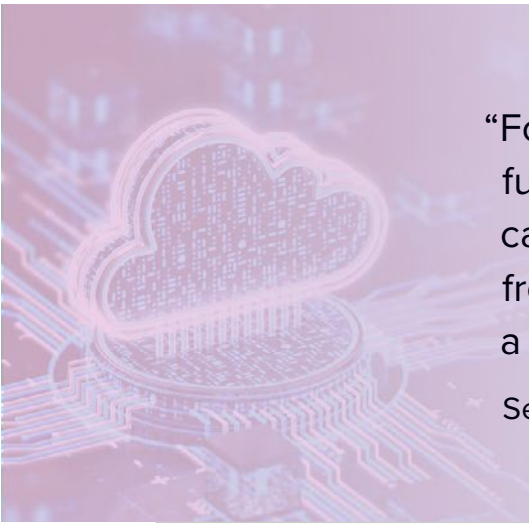
Senior Digital Infrastructure Manager, Public Sector

It uses dedicated applications to track its power utilization and carbon emissions against organizational goals, and the IT department shifted from tracking simple utilization of compute and storage to a more complete array of metrics several years ago.

On the sustainability side, this organization surpassed its goals for power saving. At 60.3% power savings, and 199.5 ton/year of CO_2 removed from its datacenter infrastructure, the organization vastly exceeded its expectations by moving to a public cloud model with Nutanix NC2.

From a performance perspective, Org2 felt that there were several benefits to its ability to shift workloads to the public cloud with NC2. GPU-accelerated compute for rendering workloads, lower latency and greater bandwidth due to data locality, and a more robust network backbone have all yielded better performance for key workloads within the organization.

Visibility and insights were another area touched on as a key benefit. Org2 found that the metrics and insights that were trackable by a combination of Nutanix's and its cloud provider's technology stacks exceeded what the organization was able to achieve on premises, increasing efficiency for both individual workloads and staff. Automating management tasks without the need to reengineer workloads "gave more time to be efficient in other areas that the organization has always wanted but never could do with the resources it had."



"For the next five years, we've capacity planned for future growth, we've got enough resiliency and capacity … so I don't need to procure any more services from the cloud provider or Nutanix. There's been a great financial benefit to us."

Senior Digital Infrastructure Manager, Public Sector

Considering Nutanix for Multicloud Modernization and Sustainability

The Nutanix Cloud Infrastructure (NCI) solution and Nutanix Cloud Clusters provide a platform for organizations to optimize their IT and cloud resources in order to modernize their application portfolio and aim to provide sustainability and operational benefits in a plethora of ways across three broad categories, whether infrastructure assets are on premises, at the edge, or within multiple public clouds.

Datacenter Footprint Consolidation and Workload Placement/Location

Reducing datacenter footprint while maintaining the same or better levels of performance and scalability is an obvious benefit for organizations, both operationally and from a sustainability perspective.

By shifting appropriate workloads into public cloud environments, enterprises can leverage what is generally significantly more efficient infrastructure due to the design, scale, and even location of those resources — public cloud providers have the ability to manage "sustainability arbitrage" by operating in global locations with significantly more efficient sources of power and even cooling

and much lower carbon intensity. License portability across these platforms, vendors, and geographies simplifies this process in most cases, which reduces the cost and complexity seen in some hybrid multicloud deployments.

This improves scalability, supply chain efficiencies, and supply chain risk reductions, as the availability of capacity to the organization doesn't depend on best guesses about future demand or worst-case scenarios for infrastructure utilization.

Finally, the ability to not just utilize a single public cloud as the sole deployment methodology means that Nutanix customers with a hybrid multicloud environment can operate or migrate workloads to the edge, back to on-premises infrastructure, or to another cloud where the application attributes, changing regulations, privacy or compliance, or internal governance requires it.

Visibility and Management Optimization and Automation

Organizational IT and cloud resource visibility has become a hot topic for companies looking to understand exactly where and how their resources are being consumed. IDC's 2024 *State of FinOps Survey* indicated that 74% of respondents sought to control cloud spending, with up to 30% of that spend being considered "waste". Heterogeneous on-premises and cloud environments can make this extremely difficult to do, without a consistent management plane that is able to account for disparate workload operating environments.

By enabling a single pane of glass across IT and cloud infrastructure footprints, the Nutanix Cloud Manager (NCM) suite of solutions aims to not just simplify these activities but empower organizations to monitor and act on the insights they can gain from their application portfolio. Choosing a deployment location for a workload is not a "one and done" process; identifying the outcomes of those decisions, determining how their infrastructure utilization impacts sustainability and business outcomes, and being able to frictionlessly redeploy workloads to the most appropriate infrastructure as requirements change allow organizations to address costs, performance, availability, resilience, regulatory, and sustainability needs in near real time.

Business Resilience and Disaster Recovery

Rather than operate two or more versions of the same infrastructure at multiple locations to ensure redundancy and resilience, NC2 makes it possible to maintain a duplicate environment in one or more public cloud environments with minimal resources available to it. Only in the event of a disaster event or test would those resources be quickly scaled to meet the requirements of the application portfolio required to return the business to operation.

Hyperscaler environments are not only geographically distributed but are also typically more robust and resilient than traditional datacenters, increasing business continuity and disaster recovery capabilities.

This not only eliminates the cost of procuring hardware (and the manufacturing, operational, and end-of-life ewaste that implies) and operating a separate datacenter but also matches sustainability requirements, as the power, cooling, and CO_2 emissions from multiple, sometimes idle, datacenters are substantially greater than lower-intensity public cloud infrastructure waiting for a "pilot light" failure signal. While this approach may not be suitable for every application in every instance, there is a broad spectrum of workloads that can benefit from these efficiencies.

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Future Outlook

IDC predicts that, in only two years, **60% of large organizations will require a carbon neutrality strategy as a standard part** of enterprise technology procurements and RFPs compared with 40% in 2023 (see **Figure 3**).

FIGURE 3

Decarbonizing AI Infrastructure

IDC PREDICTION 2024

By 2026, **60% of enterprises will implement sustainable AI frameworks,** leveraging data-driven decisions to scale AI operations across datacenter locations while meeting decarbonization goals.

Note: For more information, see *IDC FutureScape: Worldwide IT Industry 2025 Predictions* (IDC #US51736824, October 2024). Source: IDC, 2025

This will inform many IT and cloud infrastructure choices, as most organizations are still in the early stages of implementing ESG metrics as well identifying and collecting relevant data for these initiatives.

Power of the C-Suite

In IDC's 2024 *CEO Sentiment Survey*, IDC found that sustainability/ESG technologies are top of mind for new investments over the coming 12 months, with 44% of CEOs indicating it ranked in their top priorities, a clear reaction to last year's survey, in which 38% indicated that shifting sustainability regulations were a key business risk. This indicates a clear intention to pursue sustainability initiatives and the fact that technology is considered a key enabler for these processes.

IDC survey findings further indicate that sustainability initiatives will primarily be funded from within the IT budget and from dedicated ESG budgets allocated, typically under the CSO or sustainability manager. Notably, IT leaders will not be the sole or primary decision-makers but will need to collaborate with other business functions on decisions and execution for corporate sustainability initiatives.

The call to action for CEOs is clear: seize the moment to lead in sustainability — prioritize ESG technologies in your investment strategy, collaborate across departments, and leverage both IT and dedicated ESG budgets to transform regulatory risks into opportunities for innovation and leadership.

Increasing Regulations

Increasingly powerful, wide-reaching, and complex regulatory pressures will also continue to drive IT to increase sustainability initiatives. While Europe is considered the leading region for this evolution of ESG regulation, IDC expects other regions to follow suit. The availability and cost of electricity (increasing at a CAGR of almost 20% through 2028, or double the growth of datacenter capacity), cooling, and floorspace around the globe will force other regions to focus on finding ways to reduce these costs, as well as their emissions.

AI and GenAI Are a Double-Edged Sword

According to IDC's 2024 *AI and Sustainability Survey,* 66% of global organizations feel that AI and its derivatives are important or critical to their sustainability journey. Identifying efficiency gaps, improving operations, and increasing reporting and regulatory compliance are key reasons. At the same time, 30% indicated that energy demand and carbon emissions from those same AI-related activities was their main sustainability concern — the top factor.

This creates significant opportunities for infrastructure and platform vendors, many of which are aiming to support their customers' wider corporate sustainability objectives. Vendors with a strong understanding of ESG compliance requirements and offerings that are flexible to adapt to future needs will be positioned well to become trusted partners to organizations on this journey. Furthermore, tech vendors that can illustrate business benefits from sustainability investments, not just in terms of (regulatory) risk management but also in other aspects, such as power and cooling savings, CO_2 reduction, reduced datacenter footprints, and associated operational efficiencies, will reap greater benefits from these changing priorities.

Challenges/Opportunities

The two Nutanix customers surveyed in this study are ahead of the curve when it comes to measuring the impacts of datacenter modernization and cloud utilization on sustainability; most organizations worldwide are predominantly in the early stages of identifying and collecting ESG data, let alone capitalizing on sustainability for operational and financial performance.

IDC's *FERS Survey, Wave 3* showed that, last year, approximately 60% of global organizations were at or below the halfway mark of defining and developing the sustainability metrics they intend to focus on, and over 80% were at or below that mark in identifying and collecting the data required to operate on those metrics.

As datacenter ESG performance becomes more of a driver for overall organizational sustainability (driven primarily by Scope 3 reporting requirements) and tech vendors continue to support consolidation and reduction technologies, along with providing platforms and tools that allow enterprises to determine the best deployment methodologies on a workload-by-workload basis, we expect to see these numbers increase substantially; providing proof points around application modernization and mobility and their effects on operational efficiency and sustainability outcomes will further motivate enterprises to adopt these technologies.

There are both organizational and technical challenges facing IT teams seeking to improve sustainability metrics, reporting, and results in their organizations. A lack of sustainability expertise and capabilities within the enterprise and complex interactions between operations and supply chains, along with a lack of transparency and visibility, a lack of data to prioritize key objectives, and an inability to prove positive impacts from sustainability initiatives all require organizations to acquire and develop skills within their ESG working groups but also to leverage the capabilities of technology partners to support forward progress with IT platforms, software, and services that can help demonstrate this value.

There are both organizational and technical challenges facing IT teams seeking to improve sustainability metrics, reporting, and results in their organizations.

On the technical side, technical debt from existing infrastructure can slow application modernization activities until organizations can prove that investments in new technologies can both mitigate the effort and cost of maintaining older applications and infrastructure. With capital investments being demanded by new workloads such as AI and GenAI, along with increased spending on resilience and security, enterprises' budgets and human capital are often stretched thin. Key to overcoming this barrier is a holistic view of organizational priorities, application portfolios, and IT and cloud infrastructure real estate. Modernization activities must overcome inertia by proving out their benefits in multiple areas — simplifying application development, deployment, and migration; consolidating on-premises infrastructure and pivoting to public cloud where appropriate; increasing resilience and security; and freeing up financial and human capital through operational efficiencies.

Conclusion

Datacenter modernization and sustainability are no longer optional but essential for organizations committed to remaining competitive and responsible in the digital business era.

They are also moving forward in lockstep with each other — many initiatives that improve sustainability are key to modernizing IT and cloud infrastructure utilization and vice versa. The balance between on-premises and public cloud datacenter infrastructure will be critical — IDC's research estimates that cloud computing will save about 60 million metric tons of CO_2 globally from being emitted into the environment by 2027 compared with the loads being run in internal datacenters.

Achieving the kinds of benefits seen by the organizations in this study didn't just lead to compliance with regulatory bodies or an improved public image — they reduced power utilization, cooling requirements, and CO_2 emissions while yielding dramatic savings on infrastructure costs, lowered operational costs, improved IT staff efficiency, and increased business resilience, all while providing the flexibility and scale the organizations required to continue to be competitive in a digital world.

While your organization's mileage may vary, addressing the needs of internal and external stakeholders for business, technology, and sustainability outcomes demands consideration of the cutting-edge platform technologies that can support modernization and ESG goals in a holistic manner.

> **Cloud computing will save about 60 million metric tons of CO_2 globally from being emitted into the environment by 2027. This is the equivalent of removing 13 million cars per year."**
>
> IDC's *Datacenter Trends: Sustainable Datacenter Builds and CO_2 Emission*

About the IDC Analyst

Dave Pearson

Research Vice President, Infrastructure Systems, Platforms and Technologies Group, IDC

Dave is Research Vice President for the Storage and Converged Systems practice within IDC's worldwide infrastructure research organization. He also oversees IDC Canada's Infrastructure Solutions research practice. Dave manages a team of analysts that cover both research domains. On the worldwide infrastructure research side, he and his team are responsible for IDC's storage, integrated, hyperconverged, and composable systems and platforms. This includes storage for performance-intensive use cases such as high-performance computing, artificial intelligence, and analytics. It also includes cloud-enabled infrastructure and infrastructure used for cloud deployments.
On the Canadian side, he and his team are responsible for research on computing, storage, networking, and security, as well as contributing to edge, cloud, cognitive, and infrastructure software research.

More about Dave Pearson

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IDC Research, Inc.
140 Kendrick Street, Building B, Needham, MA 02494, USA
T +1 508 872 8200

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