Navigating Sustainability in the AI Era

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- **This IDC InfoBrief examines how enterprises are navigating sustainability in the AI era.** The rapid growth of AI investments brings significant energy and environmental considerations, particularly due to the high-power demands of AI computing and the potential increase in eWaste. Ethical concerns around AI development and deployment are also important.
- **Organizations are adopting various strategies to mitigate AI-related environmental impacts,** including maintaining a strong on-premises component in their AI infrastructure spending.
- **IT leaders consistently rate IT infrastructure providers as critical partners for responsible AI enablement** that offer opportunities to deliver sustainability outcomes through responsible AI scaling, optimized workload placement, long-term energy efficiency planning, liquid cooling implementation, renewable energy integration, and circular IT management. Leveraging AI helps in advancing sustainability goals.

Because sustainability metrics are closely linked with positive business outcomes, embedding sustainability considerations into infrastructure decisions is increasingly critical.

This document provides a deeper understanding of the benefits and challenges of navigating sustainability in the AI era by sharing findings from interviews that IDC conducted with IT leaders who are deploying AI infrastructure in their datacenters while balancing sustainability and business goals.

Sustainability Is a Strong Component of AI Investment Decisions in the AI Era

Executives recognize that business and sustainability outcomes are inextricably linked in the AI era, widely reporting that sustainability metrics are part of AI investment decisions and budgets.

42% say at least half of the **AI budget will have a sustainability-related component.**

90% consider sustainability/ESG to be **equally or more important than other intended business outcomes and tracked metrics** in the context of overall AI strategy.

The extent to which environmental criteria factor into AI buying decisions and IT vendor selection is particularly interesting.

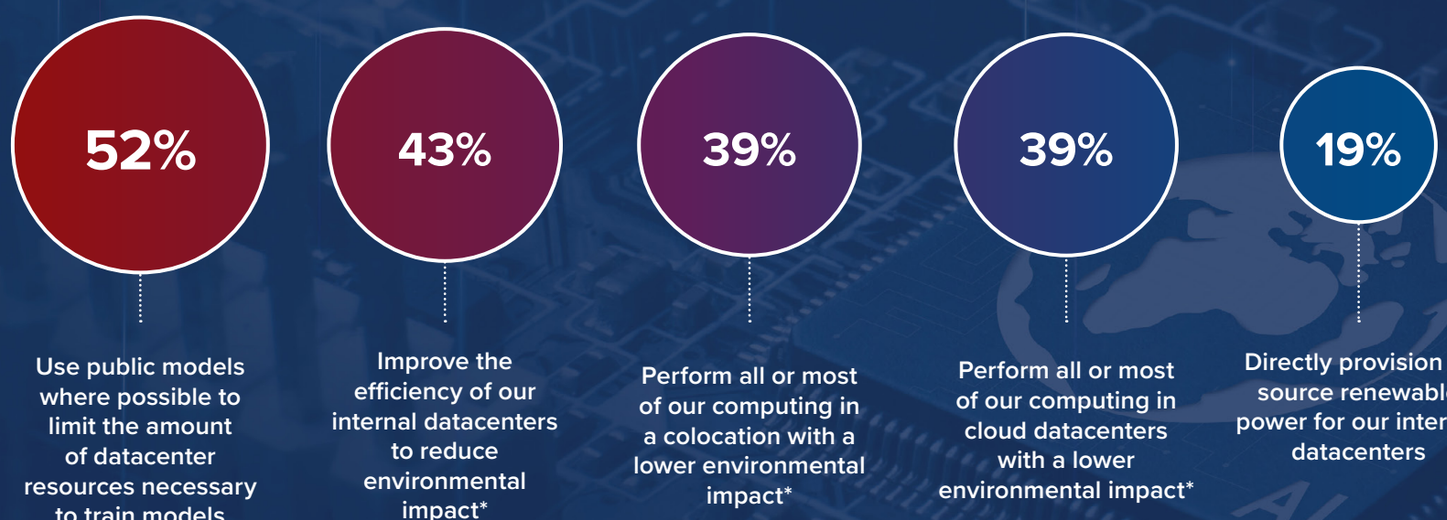
About **2/3 mostly** work with IT vendors and datacenter providers that meet **environmental criteria.**

Only **2%** say they **don't consider environmental criteria** in their AI buying decisions.

Source: IDC's *Sustainable AI and AI for Sustainability Survey 2024*, March 2024

Organizations Are Using Various Approaches to Mitigate AI-Related Environmental Impact

What is your organization's primary approach to mitigating its AI-related environmental impact?



*Measured by metrics that include carbon usage effectiveness, power usage effectiveness (PUE), and water usage effectiveness.
n = 354; Source: IDC's *Datacenter Operations and Sustainable Survey,* March 2024

AI workload placement is a critical consideration, largely because of **electricity costs,** which are the biggest operating expense for datacenters:

46%
of total spending for enterprises

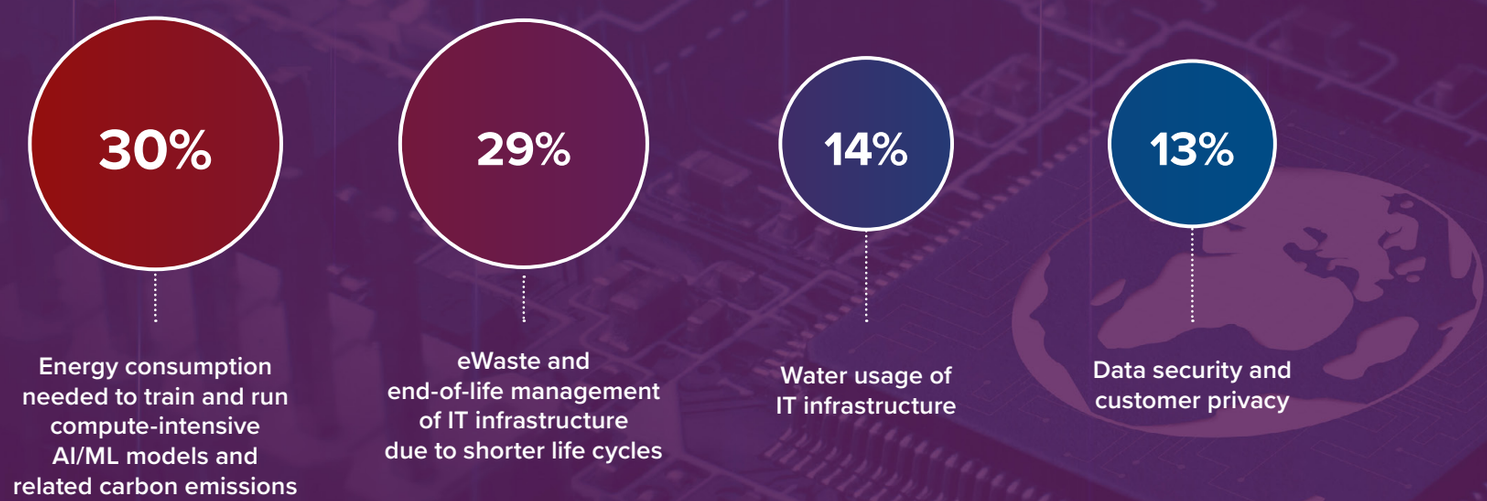
60%
of total spending for service providers

This underscores the importance of optimizing workload placement to manage costs, improve efficiency, and reduce environmental impact.

Source: IDC's *The Financial Impact of Increased Consumption and Rising Electricity Rates in Datacenter Facilities Spending,* 2024 (IDC #US52548324)

The Sustainability Challenges of Implementing AI Cover the Full Life Cycle of IT Infrastructure Deployment

What is your organization's main sustainability concern while deploying or using AI and GenAI?



"While current models [of datacenter compute hardware] offer a certain level of efficiency, rapid advancements in energy efficiency mean that assets purchased today may become significantly less efficient than newer assets within a typical life span of seven to eight years. This obsolescence can hinder the achievement of ESG goals, prompting us to shift towards leased or as-a-service hardware models."

IT Executive, Software Company
Source: IDC interview, 2024

n = 354; Source: IDC's *Datacenter Operations and Sustainable Survey,* March 2024

Executives Consider IT Providers Essential for Responsible AI Enablement

IDC identifies the following **best practices for working with vendor partners** to maximize sustainability and business outcomes:

SCALING AI RESPONSIBLY

This means identifying use cases that will deliver business value. Some of these help drive sustainability improvements.

> "We focus on predictive maintenance, using AI and ML algorithms to better determine when maintenance is required."
>
> *IT Leader, Manufacturing*

PLACING WORKLOADS APPROPRIATELY

Privacy, security, and data sovereignty concerns are reigniting decisions to run generative AI workloads in on-premises datacenters. Many enterprises also find it more cost-effective to run those workloads on premises than in the cloud.

> "Our [on-premises datacenter] costs are significantly less than what it costs to consume the same resources from public cloud providers."
>
> *IT Leader, Software Provider*

Source: IDC's *Sustainable AI and AI for Sustainability Survey 2024*, March 2024

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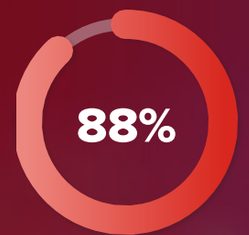

of executives rate IT infrastructure providers as strong partners in addressing AI deployment's sustainability challenges.

However, IT vendors must drive innovations and employ best practices to enable responsible AI implementations.

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MANAGING ENERGY EFFICIENCY WITH LONG-TERM PLANNING

Working with hardware vendors to plan for energy-efficient innovation is key. **All interviewees noted that they actively work with their OEM vendors to drive improved IT hardware energy efficiency.**

Additionally, energy expertise in IT sourcing is becoming critical. Interviewees noted that the ability to work with vendors on energy consumption specifications and **model out consumption over a period of three to five years is necessary to implement these frameworks.**

LIQUID COOLING

With the level of heat that AI infrastructure generates, many datacenters are reaching the limits of air cooling capabilities, driving datacenter operators to transition to and adopt liquid cooling approaches to increase energy efficiency. According to IDC research, liquid cooling is the predominant cooling method for approximately 50% of high-density racks (40kW+) with a modest increase in 2 years.

"All the new hardware we are making now is going to be taking advantage of liquid immersion cooling. We understand it's a long game."

IT Leader, Cloud Services

REDUCE PUE FIRST, THEN CONSIDER RENEWABLE ENERGY AND OFFSETS

The availability of carbon-free energy is important to help curb AI's environmental impact, but IDC interviewees noted that reducing energy consumption comes first.

"We first have a core focus on bringing our PUE down. Better power usage effectiveness benefits us as a company. Then we go for alternative, renewable energy sources."

IT Leader, Software Provider

CIRCULARITY

ITAD services, refurbishment, redeployment, and responsible eWaste management are critical elements of sustainability and cost-saving opportunities in the AI era. One of the biggest challenges of GenAI investment is the pace of technology development and obsolescence.

"[IT hardware] vendors are understanding that the circular economy is where the industry is headed. But there's still a lot of catch-up, and we are at a critical point; everybody wants to do it responsibly."

IT Leader, Cloud Services

Note: According to IDC research, liquid cooling is the predominant cooling method for approximately 50% of high-density racks (40kW+), representing a modest increase in two years.
n = 354; Source: IDC's *Datacenter Operations and Sustainable Survey,* March 2024

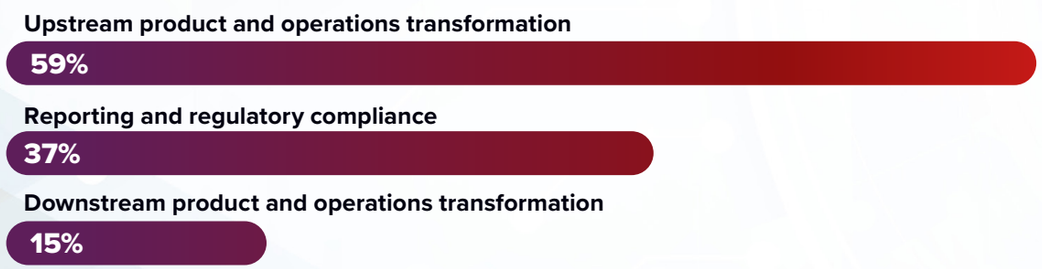
Navigating Sustainability Also Involves Applying AI to Advance Sustainability Goals

Executives are investing in AI for sustainability, recognizing the **vast potential to meet and surpass sustainability targets** while delivering positive business outcomes.

68% of executives are planning to **increase investment** in AI for sustainability/ ESG purposes.

According to survey respondents,

AI will have the biggest impact on sustainability for:



Executives also see an opportunity for AI to impact materiality assessments, strategy development, and downstream operations, reflecting the full breadth of AI's widespread potential to transform business operations.

Note: Product and operations transformation refers to upstream (i.e., sourcing, manufacturing, packaging, shipping, and sales).
n = 354; Source: IDC's *Datacenter Operations and Sustainable Survey,* March 2024

One of the key challenges to realizing AI's potential for sustainability is the common refrain of data availability and quality.

Number 1 challenge:

47% say that data is available externally but difficult to obtain due to collaboration challenges.

"One of our initial stages is to get enough data into our ESG software system so we can start identifying anomalies first and then opportunities second. I know that if I can get enough data together, there's an opportunity to generate insights."

Sustainability and ESG Leader, Manufacturing
Source: IDC interview, 2024

Key Takeaways

As AI adoption accelerates, sustainability must be a core consideration in infrastructure decisions. A strategic approach ensures long-term efficiency, resilience, and environmental responsibility.

Integrate Sustainability Early

Embedding sustainability into AI infrastructure decisions now ensures a resilient foundation as AI technologies and use cases evolve.

Scale AI Responsibly

Take a holistic approach to AI deployment, considering workloads, data management, infrastructure, and location to balance performance and sustainability.

Make Sustainability Actionable

Operationalize sustainability by aligning AI infrastructure decisions with long-term efficiency and environmental goals.

Partner for Impact

Work with a trusted provider that has proven expertise in enabling sustainability transformation and integrating sustainability into AI strategies.

About the IDC Analysts

Lara Greden

Senior Research Director, Infrastructure-as-a-Service Solutions, Flexible Consumption, and Circular Economy, IDC

Lara Greden leads IDC's worldwide research on IT infrastructure as-a-service (aaS) solutions, flexible consumption models, leasing markets, and circular economy sustainability strategies. Her analysis provides insight from both a supply-side and a buyers, point of view, with core research coverage including circular economy and sustainability for IT assets and the evolution of procurement strategies for better operating models from purchasing, leasing, and financing to aaS models, also known as flexible consumption. Based on her expertise on procurement strategies, IT asset life cycles, and sustainability, Lara's research helps vendors and buyers understand the top drivers of circular economy market strategies and flexible consumption models, including the impact of these new buying behaviors on long-term IT asset values and forecasts.

More about Lara Greden

Curtis Price

Program Vice President, Infrastructure Services, IDC

Curtis Price is the program vice president of IDC's Infrastructure Services group. He oversees all research efforts within IDC's Network Life-Cycle Services, Wireless Infrastructure Services, and Software and Hardware Support Services programs. Mr. Price provides expert insight and analysis of the trends and market dynamics impacting the network services market within the enterprise and telecommunications sectors.

More about Curtis Price

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