

From targets to technology: how CTOs are rewiring sustainability

In the green transition, chief technology officers are shifting gears, moving from a supporting role to execution engines.

For years, sustainability sat at the intersection of ambition and frustration. Targets were set at the top, pressure mounted from regulators and stakeholders, yet progress on the ground often lagged. Today, that dynamic is changing, and the shift is happening inside the technology function.

Sustainability has become a tech topic, and chief technology officers (CTOs) know it.

Our global study of 600 CTOs (or equivalent) reveals a clear pattern: sustainability has become a technology-led execution challenge. More than 95 percent say they play an active role in driving sustainability, regardless of region or industry. Their involvement spans shaping technology road maps, enabling data transparency, driving innovation, and implementing efficiency measures. CTOs describe themselves not just as enablers, but as orchestrators.

This shift matters. Technology is no longer just an enabler of sustainability; it's where emissions are generated, measured, optimized, and increasingly reduced. From data centers and cloud architectures to AI models and procurement choices, the carbon footprint of the enterprise is now deeply embedded in technology decisions. In practice, this makes the CTO the operational backbone of the sustainability agenda.

Yet while CTOs are clearly engaged, our study also exposes a gap between intent and scale. Sustainability progress today is real—but selective, economically driven, and constrained by data, skills, and legacy structures. The next phase of the green transition will depend on whether CTOs can move from opportunistic optimization to deliberate system-building.

Pressure is universal; execution is not

CTOs report pressure from all sides: regulators, boards, shareholders, customers, and vendors (see figure 1 on page 2). No single stakeholder dominates. Sustainability has become a baseline expectation rather than a differentiator.

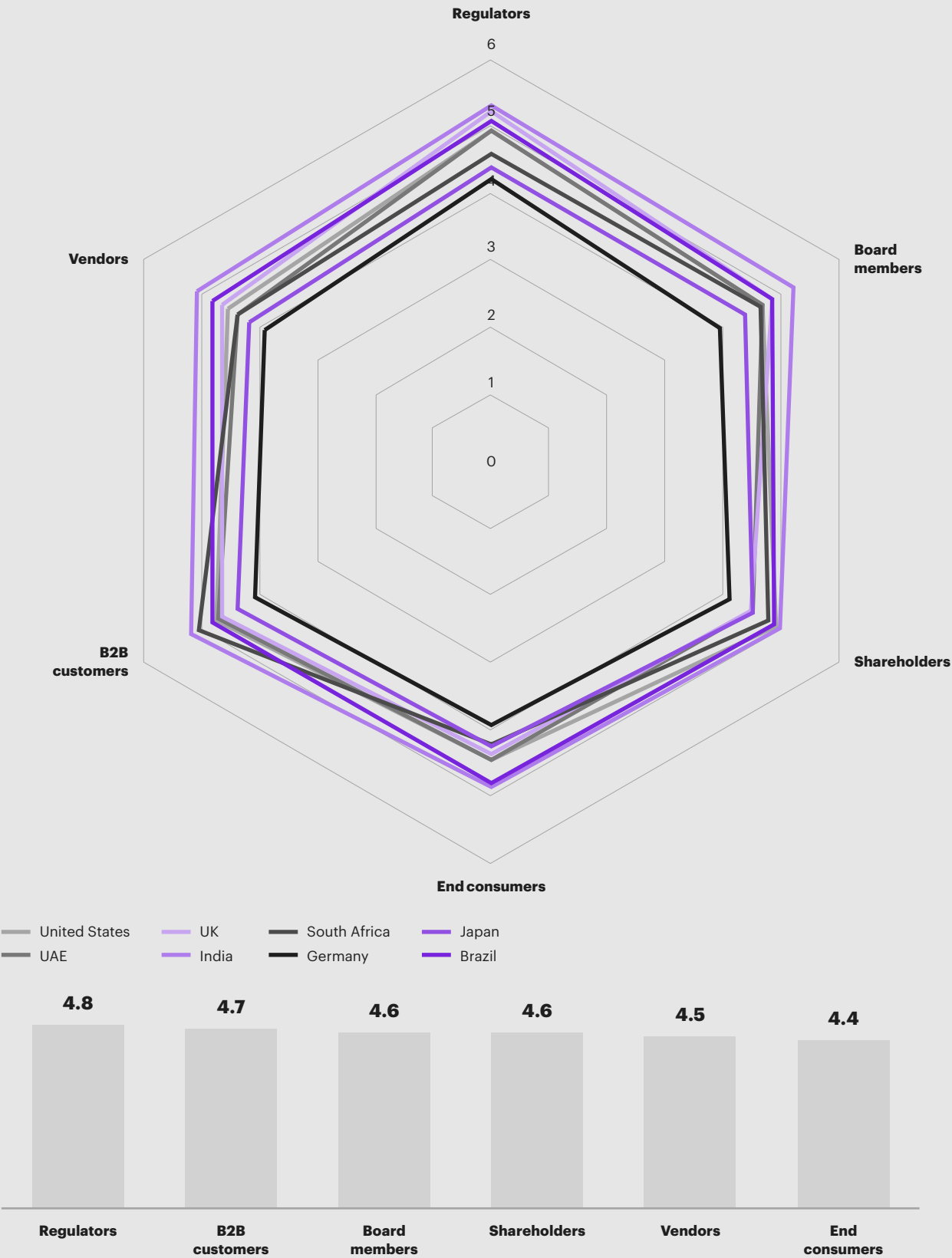
In this environment, ambition alone no longer distinguishes leaders from laggards. Execution does.

The next phase of the sustainability transition won't be driven by new targets or louder commitments. It will be led by organizations that can industrialize sustainability through data, systems, skills, and governance, and that can extend their impact beyond their own operations into the value chain.

Sustainability progress today is real—but selective, economically driven, and constrained by data, skills, and legacy structures.

Figure 1
Chief technology officers are under pressure from all sides

Average pressure by stakeholder group
(1 = lowest; 6 = highest)



Source: Kearney analysis

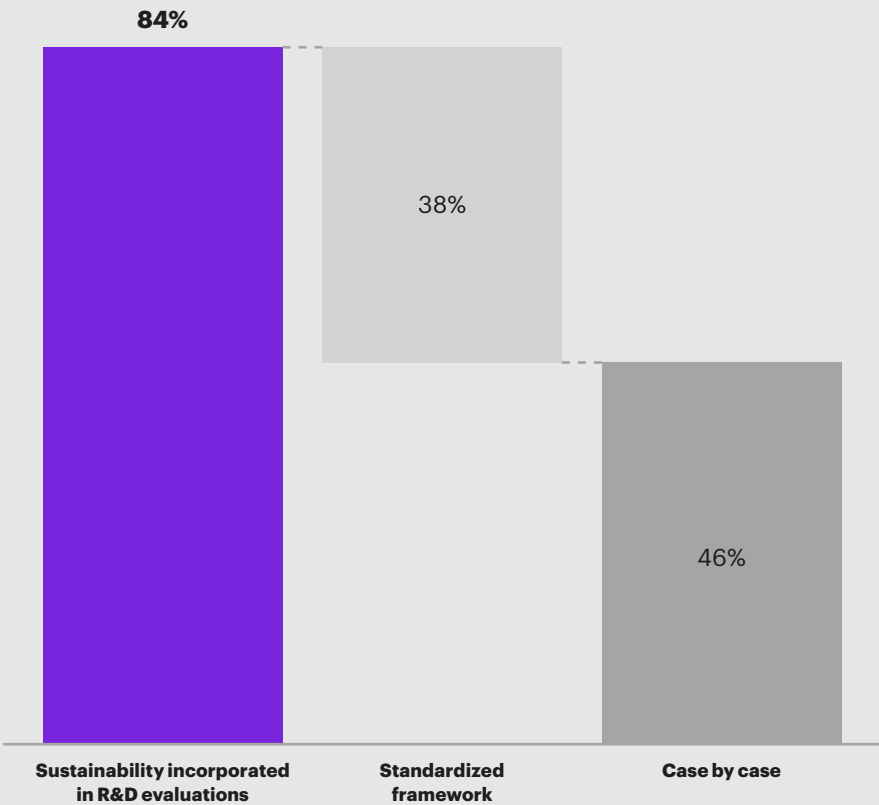
Sustainability has become a design constraint but not yet a hard one

Our study shows that sustainability is already influencing technology strategy and R&D decisions—but unevenly. Eighty-four percent of organizations include sustainability considerations in R&D investment evaluations, and carbon metrics influence technology choices in the vast majority of companies. “We don’t consider sustainability” has become an outlier position.

That said, only 38 percent have formalized this into a standard framework (see figure 2). For the rest, sustainability is a negotiable input rather than a non-negotiable design constraint. And this distinction matters. When sustainability is embedded into decision frameworks, it becomes a design constraint that shapes architectures, vendor choices, and long-term road maps. When it remains informal, it competes with cost, speed, and performance—and often loses when trade-offs become acute. The result is a sustainability agenda that advances where it aligns with short-term economics and stalls where it doesn’t.

Figure 2
Sustainability has become a design constraint

Sustainability considerations in R&D investment valuations and decisions



Source: Kearney analysis

Cost optimization is shaping the agenda

When we asked CTOs where they focus their sustainability budgets, the answer is strikingly consistent: energy. It’s notable that all answers were focused on environmental topics; social impact was rarely even mentioned, even though the impact of carbon-focused activities usually also have a positive impact on communities (see figure 3).

Renewable energy adoption, energy efficiency, cloud optimization, and AI-driven energy management dominate both current initiatives and perceived returns. Energy efficiency is also where CTOs see the greatest results to date.

This is neither ideological nor accidental; it’s economic.

Energy is measurable, controllable, and directly linked to operating costs. Reducing energy consumption reduces spending. Optimizing infrastructure improves margins. In an environment of rising energy prices and expanding digital footprints, sustainability and financial discipline naturally align.

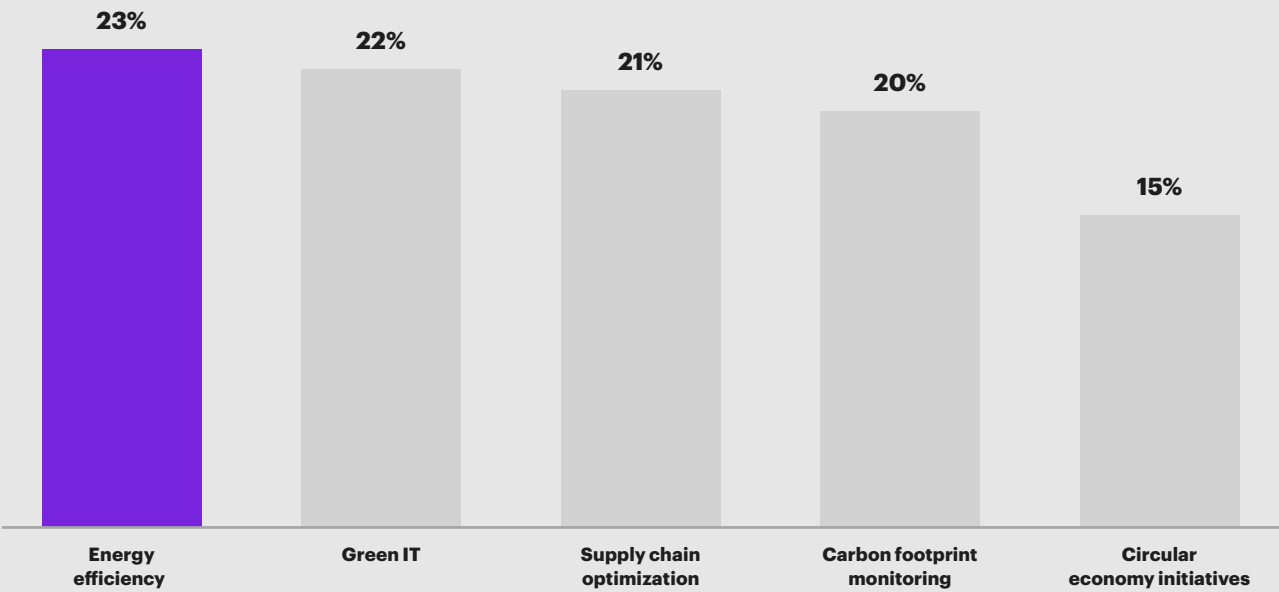
Green IT and supply chain optimization (the priorities ranked second and third respectively) follow the same logic: they bring down costs as well as emissions. In contrast, circularity comes in last, indicating that longer-term business cases are not prioritized.

The implication is quite clear: sustainability progress accelerates when it looks like operational excellence and slows dramatically when it doesn’t.

Half of the CTOs in our study say cost is the biggest barrier to integrating AI and digital solutions to accelerate sustainability, while nearly a third cite unclear ROI. CTOs are prioritizing sustainability actions with a positive business case and deprioritizing those that lack one. This isn’t surprising. In fact, it seems this economic discipline has enabled tangible progress. But it has also narrowed the sustainability agenda to what pays back fastest. This might be too shortsighted. Many companies have not updated their business case evaluation models to include indirect value drivers or the cost of inaction. This shortsightedness means many companies stand to miss out on opportunities of growth or face a loss of market share or loss of asset value as they are stranded with dated technologies.

Figure 3
CTOs are focusing their sustainability budgets on energy

AI application to advance sustainability goals



Source: Kearney analysis

AI is being applied everywhere, but maybe too fast

Artificial intelligence is becoming the default sustainability tool. It is the most widely used digital technology to advance sustainability goals today and the one CTOs expect to have the greatest impact over the next five to 10 years.

AI is being applied broadly across energy efficiency, green IT, supply chain optimization, and carbon monitoring. No single use case dominates.

Yet our study also reveals a structural weakness: AI is running ahead of its foundations. Thirty-eight percent of CTOs cite data availability and quality as a major barrier, while 31 percent point to legacy infrastructure. In effect, many organizations are deploying advanced analytics on top of incomplete datasets and outdated systems, limiting accuracy, scalability, and impact. The risk isn't just inefficiency; it's false confidence. AI models trained on fragmented or low-quality data can produce precise answers that are strategically misleading. And this creates a paradox: AI is widely used for sustainability, but its effectiveness is constrained by the very digital debt it is meant to overcome. "Garbage in; garbage out," as they say.

The talent gap at the sustainability-technology interface

If data is one bottleneck, talent is another—and perhaps the more difficult one to solve. More than 40 percent of CTOs cite a lack of skilled talent as a key barrier to integrating AI and digital solutions for sustainability. What's missing is not generic technical skills, but expertise at the intersection of AI, data engineering, and environmental science.

This gap cuts both ways. Sustainability teams often lack deep technical fluency, leading to unclear requirements, weak governance, and under-specified use cases. Technology teams, meanwhile, may lack climate literacy, resulting in solutions that optimize the wrong variables or fail to align with science-based targets.

The result is a proliferation of tools without coherence and pilots without scale. Closing this gap requires deliberate investment in reskilling, new roles, and operating models that embed sustainability expertise directly into technology teams. Without deliberate investment in cross-disciplinary capability, organizations risk scaling technology without scaling impact.

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Circularity: strategically important, practically marginal

One of the most revealing findings of our study isn't what CTOs are focusing on—but what they are not. Circular economy initiatives rank last among AI-enabled sustainability applications and show the lowest reported impact. Only a small minority of CTOs report seeing significant results.

This doesn't mean circularity isn't important, but it does indicate it is structurally harder. Circularity cuts across product design, procurement, supplier ecosystems, and business models. It is upstream, complex, and often disconnected from short-term financial metrics. In contrast to energy efficiency, its benefits are harder to quantify and slower to realize.

In a cost-driven decision environment, circularity struggles to compete.

Procurement: the largest lever CTOs aren't pulling

Technology procurement is one of the biggest decarbonization levers CTOs control, yet it remains underused. Only 35 percent of CTOs describe embedding sustainability into procurement as part of their role. While most organizations measure the carbon footprint of their own technology operations, supply chain risk and traceability are far less mature and inconsistently integrated into decision-making.

This is a strategic blind spot.

Servers, chips, devices, data centers, and cloud contracts account for a substantial share of technology's emissions footprint, growing, and sometimes exceeding operational emissions. This is a major missed opportunity. By focusing primarily on internal efficiency, many organizations are leaving their largest scope 3 reduction lever underexploited. The barriers are familiar: data gaps, supplier complexity, and weaker short-term ROI. But the strategic importance is growing rapidly as regulation and stakeholder scrutiny extend deeper into the value chain.

The barrier, again, is not intent. It's economics, complexity, and lack of standardized data. But the prize is significant: procurement is where sustainability shifts from optimization to transformation.

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How can we go farther—faster?

Today's sustainability-tech agenda is rational, disciplined, and cost-driven. That has enabled real progress, particularly on energy and efficiency. But it also risks narrowing the field of vision.

The challenge for CTOs now is to extend the same rigor applied to energy optimization to harder domains: supply chains, circularity, and upstream emissions. That will require better data foundations, new skills, and a willingness to embed sustainability into decision rules, not just dashboards.

Five priorities stand out for CTOs who want to accelerate the pace of the transition, moving from selective progress to systemic impact:

Build the business case with better economics. Link AI and digital sustainability initiatives to clear financial and sustainability related ROI. Take a multiyear view to overcome acute in year P&L decision making and make sure to integrate direct as well as indirect drivers of value as well as the cost of inaction. Move beyond pilots to standardized value cases and make the cost of inaction visible alongside the cost of investment.

Build skills and capabilities at scale. Invest in training, reskilling, and access to expertise that bridges AI, data, and environmental science. Sustainability will not scale without people who can operate at this intersection. Upskilling the workforce and bringing in experts in new areas and intersections will strengthen and future-proof the business.

Strengthen data and infrastructure foundations.

Industrialize measurement and reporting capabilities. Modernize data platforms and infrastructure so AI-driven sustainability intelligence is reliable, scalable, and decision-grade. Start by assessing the quality of the existing data to make sure decisions are based on reliable information. Over time, focus on building maturity, getting the architecture and governance right, and managing the flow in a way that enables the organization to quickly make the best possible decisions.

Clarify strategy and ownership across the organization.

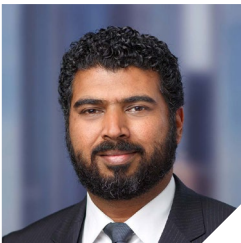
Define a clear sustainability and AI road map with roles, decision rights, and KPIs. Align technology, sustainability, and business teams around shared priorities and trade-offs. Instead of building a patchwork of solutions for smaller specific needs (often connected to reporting), there needs to be a clear understanding for how AI can enable the acceleration of positive sustainability impact.

Leverage collaboration, incentives, and partnerships.

Work with internal stakeholders, ecosystem partners, suppliers, and regulators to navigate complexity, access incentives, and accelerate implementation, especially in procurement and supply chains. Focus on fewer but more impactful partnerships that address specific needs connected to the advancement of sustainability priorities. Make it practical, and focus on building the environment needed to launch and scale more sustainable solutions and less on joint commitments with no clear actions.

The green transition won't be won by ambition alone. It will be won in architectures, contracts, and operating models. And increasingly, that puts CTOs—and the leaders who empower them—at the center of the change.

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