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# Deep Green

How data, technology and collaboration will drive the next phase of sustainability in business

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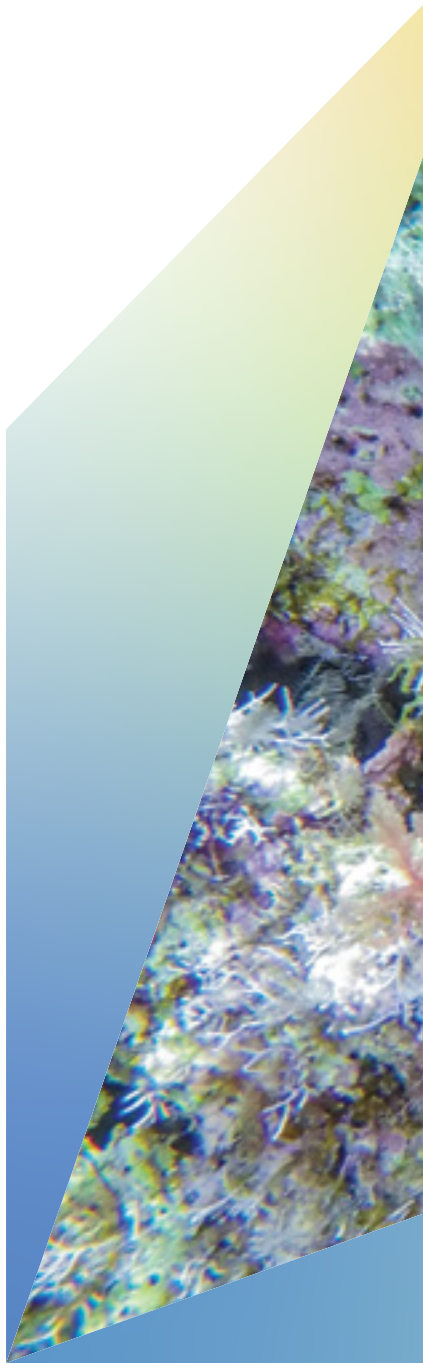


# Executive summary

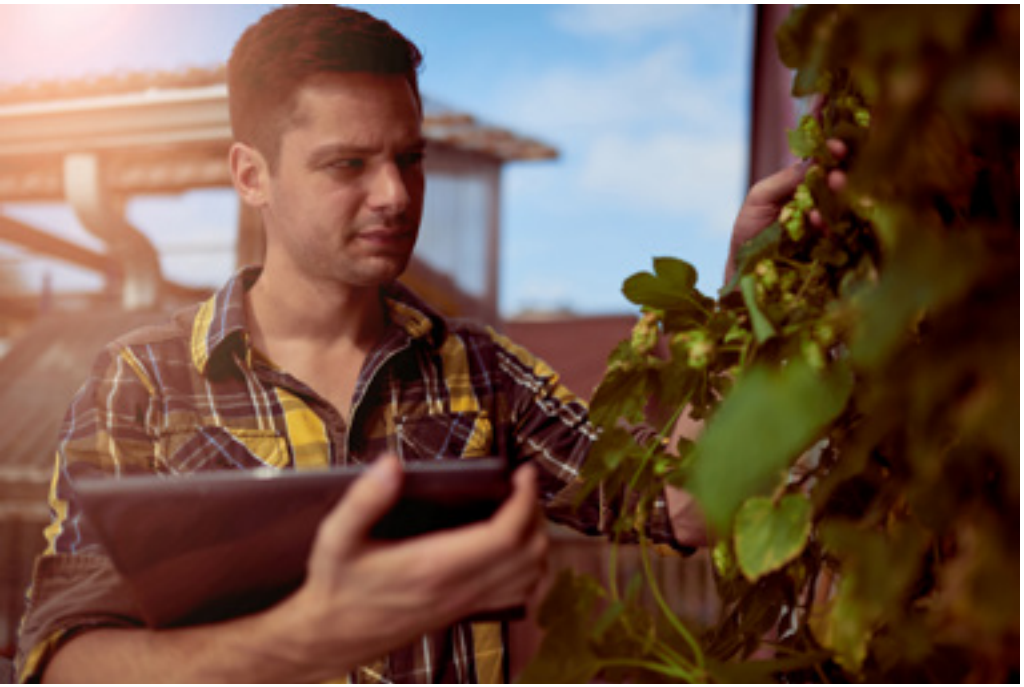
As the world grapples with the urgent need to combat climate change and resource depletion, a new breed of business is emerging. These organizations will be sustainable to the core—not just green but deeply green, with sustainability encoded in their DNA.

Sustainability thinking will influence everything these businesses do—affecting their entire sphere of control—from how they get and use their energy and materials to how they develop products and services. Moreover, this type of thinking will impact areas and entities previously outside of these businesses' control, including their suppliers, distributors, customers and partners, in pursuit of a better tomorrow.

What will drive this new breed is a growing conviction that sustainability can reveal new opportunities for those who respond to environmental, social, business and regulatory pressures with a radical and far-sighted rethink of how to operate.

Rather than just tending to the sustainability of their internal operations, deeply green businesses will collaborate in entirely new ways across their value chains—coordinating their vision, actions and decisions with other players and partners in their ecosystem. At the same time, they'll create products and offerings that go beyond mitigating environmental issues, to helping to solve them. Operating in this manner, these businesses will not only shrink their own environmental footprint and those of their stakeholders—they'll also discover entirely new ways to secure resilient growth.

We see glimmers of this future state materializing now: It's the beer manufacturer that not only meticulously tracks the journey of its barley from the field to the bottle using blockchain but also helps its farmers adopt more sustainable agricultural practices.



It's the fintech that puts its money where its mouth is, offering up to 10% cash back when customers buy from its socially responsible business partners.

And it's the apparel company that has built new links between its supplier, production and retail systems, allowing customers to see a garment's manufacturing location, materials used and conditions in the production facility. These companies are leading the charge toward a sustainable future, and they're doing it with urgency, purpose and transparency.

But this level of transparency and interconnectedness requires an expanded understanding of what it means to be sustainable. In a future-ready business, sustainability is made possible with the speed, automation and intelligence of advanced technologies, modernized ways of operating, and new collaborative models within and across value chains.

It's a big lift, but the opportunities are as great as the consequences of inaction are severe. On the one side are the greenfields that can arise from productive partnerships and market-changing, planet-saving products and services; on the other side are disrupted supply chains, dissatisfied consumers and employees, costly regulatory penalties and negative public perception.

Meanwhile, the ticking of the clock is deafening. With planetary, economic and societal signals growing more apparent every day, business leaders cannot hide in this age of radical visibility.

To find out more about the future of sustainability in business, we worked with Oxford Economics to survey 3,000 executives—across every market and sector—on their sustainability plans, challenges and vision. Through our analysis, we've devised five recommendations for how leading enterprises can outperform their markets with enduring and differentiating growth by embedding sustainability at their core:

## 1 Boost sustainability investments to realize full business value

There are two compelling sides to the sustainability coin: a need to invest on the one side, and financial rewards on the other. Our survey reveals a rapidly accelerating willingness to spend over the next few years. Between 2020 and 2025, the percentage of respondents increasing their sustainability spending by 10% or greater nearly doubles (from 26% to 51%). By 2030, the percent of respondents grows again, to 62%.

Meanwhile, survey respondents firmly tie financial performance to the sustainability actions they take. This conviction only grows over time. The number of respondents who expect their sustainability efforts to drive stronger financial performance doubles between now and 2025 (from 31% to 65%). And by 2030, the vast majority (80%) are convinced their sustainability initiatives will positively or very positively impact their financial performance.

## 2 Elevate your internal sustainability initiatives for even greater return

Unsurprisingly, respondents' sustainability initiatives are primarily focused on their internal operations—including what's commonly referred to as Scope 1 emissions—and less so on the supply chain or the impact of their products and services once they are sold and consumed.

While everyone will ultimately need to get more ambitious and expand their sustainability purview beyond what's directly in their control, there's substantial work to be done on improving the sustainability of their internal operations. Within the next two years, according to our research, the pressures of carbon abatement and climate adaptation will cause a marked shift toward more sophisticated, data-driven efforts, such as virtual simulations and advanced analytics. These will be more disruptive to the operational status quo than previous efforts.

**66%**

Of all respondents are focused on the sustainability of their internal operations

Further, as businesses revisit their sustainability strategies, they'll also need to improve the granularity, accessibility, reliability and flexibility of the data on which those targets and plans are based. These are not linear endeavors. In a complex and fluid landscape, strategy must always be regarded as organic. Companies will have to continuously redefine their baselines, targets and plans as new regulations, new technologies and new challenges emerge.

## 3 Expand your sphere of influence, upstream and downstream, to secure greater business benefits and impact

Many businesses have yet to focus on sustainability initiatives outside of their direct control, including Scopes 2 and 3 emissions. Why? Because it's an enormous undertaking. Imagine increasing communication and collaboration not just within your own company but also with your partners, suppliers, distributors, communities and customers.

To function at a deeply green level, businesses will have to be genuinely connected to their wider ecosystems. They'll use data and technology to acknowledge, address and solve for environmental challenges up and down the value chain. By leaning into this opportunity, they will innovate differently. That change will unlock new, revenue-expanding services and open new commercial opportunities, generate early-warning insights for risk mitigation and management, and establish new relationships to transform delivery and production.

Expanding your sphere of influence means treating suppliers like partners and seeing the sustainability journey as a shared one. It also means looking more creatively up and down the value chain to find atypical partners that help you reconceive products and services that can be developed, integrated and deployed for sustainable growth.

## 4 Explore the deeper application of emerging and maturing technologies, and commercially creative ways to deploy them

To expand sustainability initiatives beyond what can be directly measured, audited and improved, businesses need to boldly explore technology-driven solutions. In our survey, core technologies such as cloud, IoT and automation rank highly for both the extent to which they are deployed and their perceived effectiveness.

Now it's time to capitalize on technology that, at first, may not seem relevant in your industry.

Artificial intelligence, machine learning, advanced analytics, digital twins and blockchain—such cutting-edge technologies are necessary to expand sustainability into the larger ecosystem and create products and services that help solve environmental problems rather than just mitigate issues. Only the confident adoption of these technologies will accelerate the enterprise's impact and outcomes.

## 5 Evolve power structures to allow for necessary shifts in culture and accountability

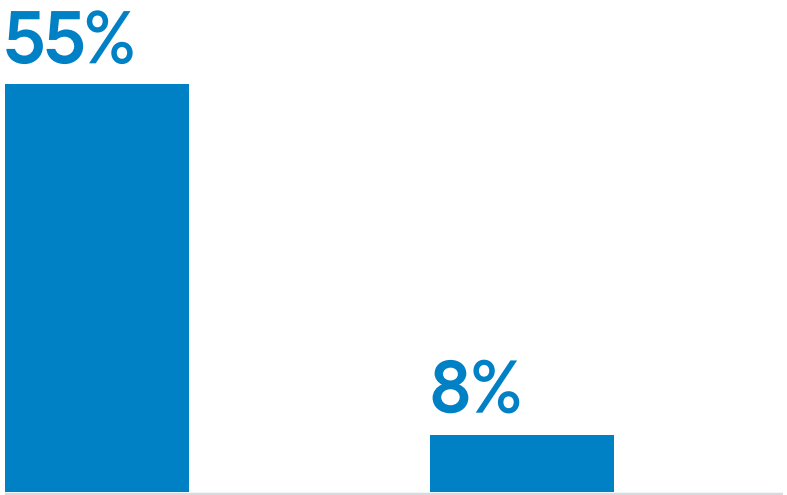
Given the organizational challenges noted by respondents, progress will only happen by getting your internal house in order, from sharpening strategies, to investing in and upskilling talent and preparing the ground for the profound organizational change that's likely to come.

Most importantly, leadership models must evolve to correct what our research reveals as an imbalance between power and accountability. Respondents report that CEOs usually develop sustainability strategies and control the funding for these strategies, while the chief sustainability officer or other senior managers are held accountable for progress or rewarded for success. This power equation needs to be balanced if companies are going to achieve expected results.

Further, talent shortages threaten to mar sustainability progress. Becoming deeply green calls for new talent and skills in the enterprise that can often be found through reskilling of the existing workforce.

Workforce demographics and dynamics have forever shifted. Even with charismatic ambassadors and change agents leading the charge, businesses need to ensure everyone is motivated to play their part in business sustainability, and for building, sharing and monitoring baselines, targets and plans.

### Leadership models are out of balance




Of respondents say the CEO is responsible for allocating budget for sustainability

Say the CEO is accountable for delivering on the sustainability strategy

# Introduction

Sustainability is fast becoming not just a way of doing business but a way of being a business. From our research over the last three years, we've concluded successful businesses in the coming decades will be those that embed sustainability thinking into the very core of all they do inside and outside the organization, all the way through their value chains and product and service lifecycles.

Deeply green, these businesses will stand out, competitively and commercially, as sustainability leaders that set the mark for transparency, authenticity and resilience in the face of the planet's—and humanity's—increasingly urgent needs.

For the last two years, our research has tracked how the concept of sustainability has expanded and intensified. As recently as 2021, we found that senior leaders saw sustainability as not just a cost on the balance sheet but as a driver for business gains like increased sales and improved brand reputation.

In our future-ready business study in 2022, the sustainability imperative was even more clear. Nearly all executives affirmed that attending to environmental, social and governance (ESG) issues is critical to being a modern business. But it also revealed a gap between sustainability mindsets and actions taken.

In our most recent study, we took a closer look at the actions businesses are taking now or plan to take in the near future, as well as the challenges holding them back from meeting their goals. Our findings reveal what needs to happen—at a strategy, technology and leadership level—to ensure businesses are ready to expand their sustainability focus into their entire ecosystem. By doing so, businesses will emerge not only as leaders in their markets but as beacons for how to be a sustainable business—a deeply green business—to meet the needs of our changing world.

2021

**70%**

said sustainability initiatives would drive higher sales

2022

**90%**

said ESG was a critical part of being a modern business

2023

**95%**

said sustainability is a vital element of their corporate strategy

# Recommendation #1

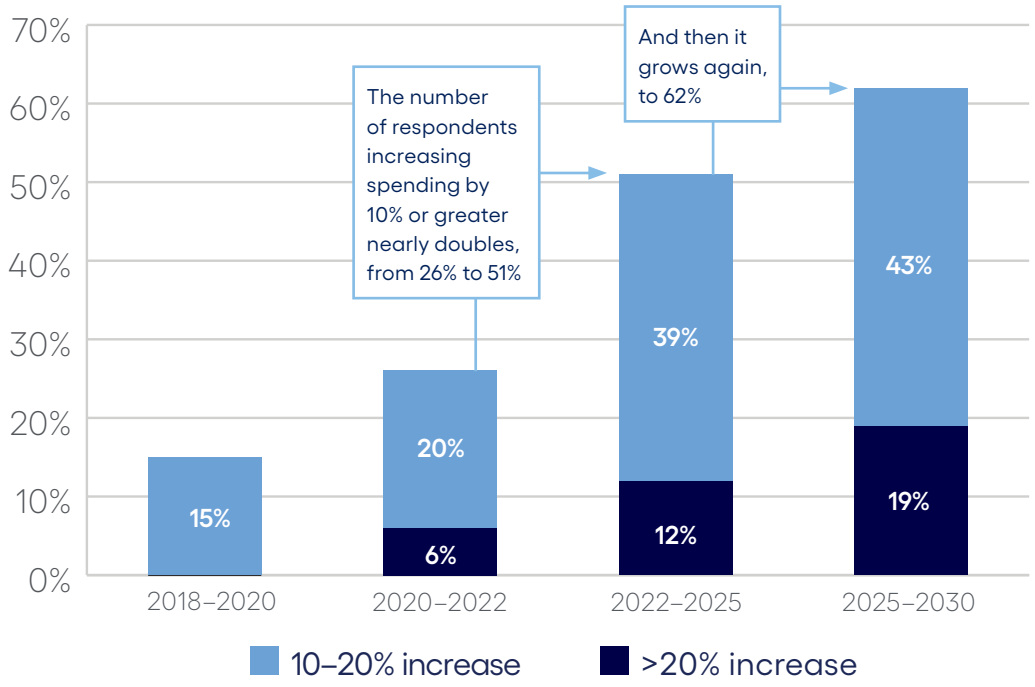
## Boost sustainability investments to realize full business value

# 1 Boost sustainability investments to realize full business value

Our current study reveals an unflagging belief in sustainability as a strategic priority, with nearly all respondents (95%) saying it is a vital element of their corporate strategy. This nearly unanimous agreement is not just talk—it's accompanied by a willingness to spend on sustainability initiatives that only grows over time (see Figure 1). In fact, between 2020 and 2025, the percentage of respondents increasing their sustainability spending by 10% or greater nearly doubles, from 26% of respondents to 51%. By 2030, the percentage of respondents grows again, to 62%.

**Figure 1: Spending will rapidly accelerate**

Q: Has your company's average annual spend on environmental sustainability changed over the following periods, and how will it change?




Source: Cognizant Research
Base: 3,000 senior executives

For respondents, investing in sustainability makes good business sense. In fact, over half (57%) ranked improved business performance as a top-three driver for sustainability efforts, a close second to their belief in the moral imperative of doing social good (59%) (see Figure 2).

**Figure 2: Sustainability is both a moral and financial imperative**

Q: What are the three most important drivers for your environmental sustainability (percent naming each as a top-three driver)

**59%**
Do the right thing for society and ensure economic sustainability

**37%**
Reduce business risk

**57%**
Improve business performance

**37%**
Comply with current or future government, industry or regulatory demands

**45%**
Demonstrate action to the investment community

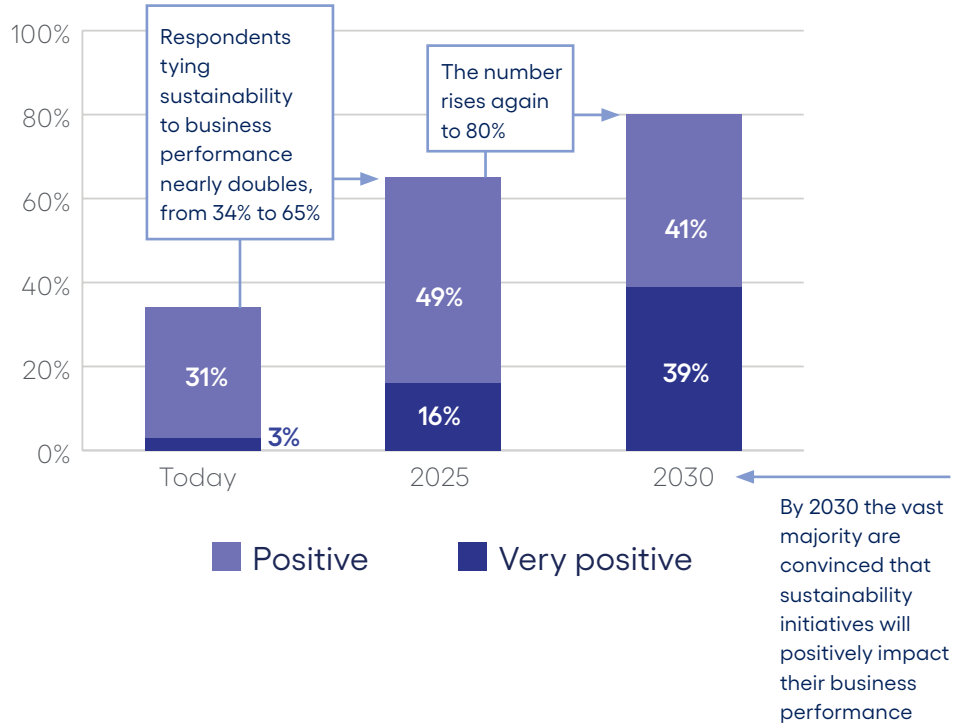
**36%**
Demonstrate action to customers/enhance brand reputation

Source: Cognizant Research
Base: 3,000 senior executives

In fact, respondents seem convinced that sustainability investments are justified by the financial rewards they will reap over time. By 2025, 65% of respondents believe their sustainability efforts will have a positive or very positive impact on their company's financial performance—nearly double the number who feel this way today (34%) (see Figure 3). By 2030, the vast majority (80%) are convinced their sustainability initiatives will positively or very positively impact their financial performance.

**Figure 3: Financial rewards rise sharply**

Q: What do you anticipate will be the impact of your company's efforts to improve environmental sustainability, across all business areas, on your financial performance?




Source: Cognizant Research
Base: 3,000 senior executives

The specific areas of business impact are far-ranging, from brand reputation, to retaining customers and employees, to reducing business risk, with more than half of respondents naming these and other areas where sustainability will have a positive or very positive impact (see Figure 4).

**Figure 4: An array of business performance impacts**

Q: What do you estimate the impact of your company's sustainability efforts will be on the following business performance indicators by 2025?

**82%**
Company/ brand reputation

**60%**
Employee satisfaction/ retention

**78%**
Attracting talent/skills

**58%**
Business risk

**71%**
Customer loyalty

**56%**
Share price

Source: Cognizant Research
Base: 3,000 senior executives

The sustainability stage is set: It has captured the hearts, minds and wallets of senior leaders, and even now, businesses are breaking out of their comfort zones to collaborate with partners, suppliers, distributors and even competitors to advance the sustainability agenda.

As a result, the business interests surrounding sustainability have shifted from the "why do it" to the "how to make it happen effectively," emphasizing the importance of making informed decisions, allocating resources and devising effective strategy.

For this reason, and with 2030 goals close at hand, businesses need to develop an ambitious strategy that will propel them into the ranks of the new breed of deep-green sustainability leaders. As one of the survey respondents said, "This is not a nice-to-have; this is a must-have, and this is table stakes to even be included in our RFP or a tender."

> “This is not a nice-to-have; this is a must-have, and this is table stakes to even be included in our RFP or a tender.”

**Survey respondent**
Senior executive, manufacturing

# Recommendation #2

## Elevate your internal sustainability initiatives for even greater return

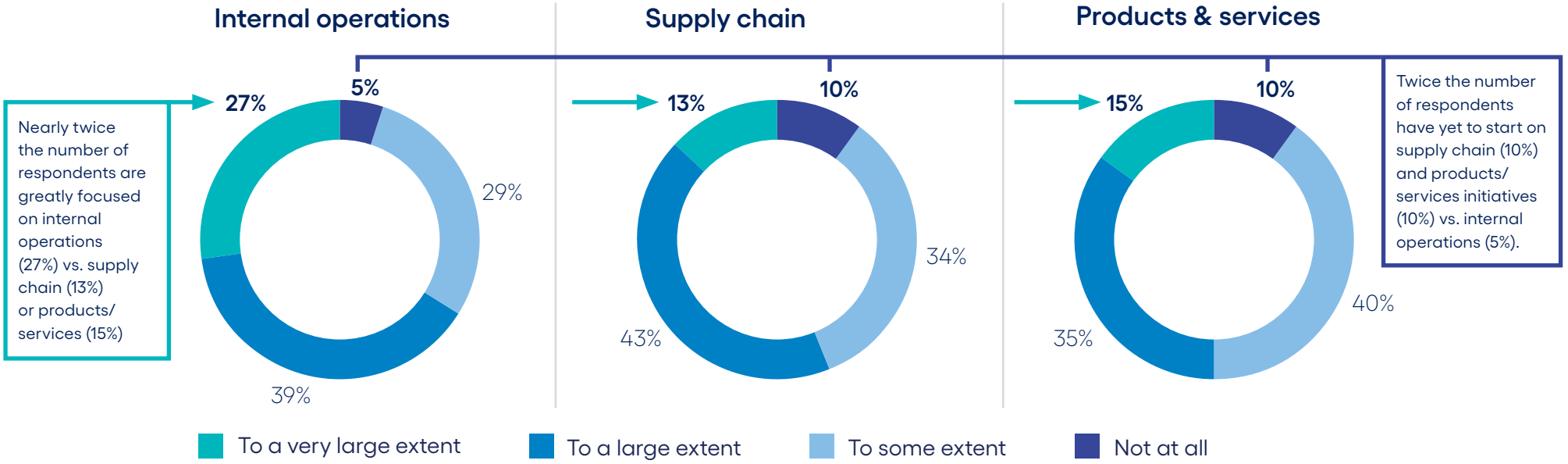
## 2 Elevate your internal sustainability initiatives for even greater return

Even now, though, most sustainability initiatives are focused on the internal operations of the business, including what's commonly referred to as Scope 1 emissions. In all, 66% of respondents are focused on internal operations—27% to a great extent—compared with 59% focused on supply chain and 50% on products and services (see Figure 5). Further, twice the number of respondents has yet to start on supply chain and product/service initiatives vs. internal operations (10% for the former vs. 5% for the latter).

This emphasis on internal operations is completely justifiable as it stems from the confidence and control businesses can exert in this area. Further, there's continued and substantial work to be done on improving the sustainability of their internal operations. In fact, our research shows that businesses are poised to build on what they've put in place for their internally focused strategies and move to higher impact, more data-intensive—and more complex—internally focused endeavors.

**Figure 5: The primary focus is on internal operations**

Q: To what extent are your environmentally sustainable strategies focused on your company's operations, supply chain or products/services?




Source: Cognizant Research
Base: 3,000 senior executives

Consider that today, the number one area for sustainability initiatives by far is the broad use of digital tools to make internal operations more energy-efficient (see Figure 6).

**Figure 6: Internal initiatives will grow in data and analytics intensity**

Q: When did you start, or when do you plan to start, implementing the following initiatives related to improving the sustainability of your internal operations?

## Top 3 initiatives

| | 2020–2022 | | 2025 | |
|---|---|---|---|---|
| 1 | 81% | Use digital tools to make operations more energy-efficient | 42% | Move to more sustainable premises |
| 2 | 63% | Recycle waste from back-office operations | 42% | Use demand/supply simulations or virtual models (digital twins) |
| 3 | 56% | Generate energy yourself more sustainably | 41% | Use data analytics to ID process improvement |

By 2025, top sustainability initiatives will require a greater level of data sharing and more sophisticated analytics

Source: Cognizant Research
Base: 3,000 senior executives

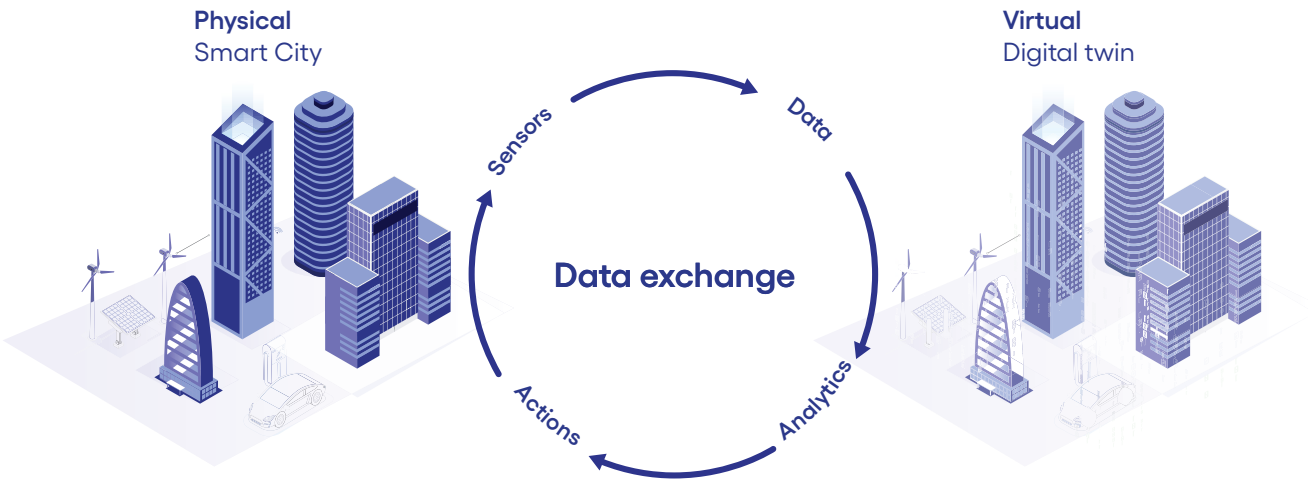
One widely used approach is the deployment of Internet of Things (IoT) sensors to monitor the emissions, water usage and efficiency of physical assets to meet the business's sustainability goals.

For instance, sensor-equipped smart factories can generate massive amounts of data that, through dashboards, offer valuable insight into waste generated on a production line. Additionally, climate control sensors connected to IoT networks can supply information regarding the carbon footprint of heating office spaces. By leveraging the data collected from these sensors, and utilizing machine learning algorithms to identify areas for improvement, businesses can gain a clearer understanding of their direct emissions and work toward reducing them.

Another widely embraced area is the use of cloud computing to support the now entrenched adoption of hybrid work models. A benefit of doing so is the reduction of both commuting-related emissions and the need for costly and environmentally harmful global travel.

By 2025, however, the top sustainability initiatives will require a greater level of data sharing and more sophisticated analysis. In addition to moving to more sustainable premises, for example, 42% of respondents plan to create virtual simulations (i.e., digital twins) of their operations and physical assets, which will enable them to experiment with more sustainable practices without disruption.

**By 2025, the number-two internal operations initiative will be the use of virtual models (i.e., digital twins) to experiment with sustainability options.**



The use of digital twins will require advanced use of real-time data to visualize, model and simulate the operational or physical environment. For instance, businesses could design the most efficient layout of a production line. Or they could figure out the best way to ensure the quality of their treated wastewater throughout their plant operations. By tying in data from the integrated asset management system, they could use data visualization and analysis to interpret the data obtained from multiple sensors, pumps and detectors in the treatment plant and, through predictive and prescriptive analysis, promote continuous improvement.

Respondents (41%) also want to take the same principles used in making their physical assets more efficient and apply those to their business processes, leveraging process mining to more deeply understand which processes could be automated to reduce operational waste or be eliminated altogether. For example, businesses are using intelligent process automation (IPA) to measure and reduce the environmental footprint of knowledge workers by streamlining repeated tasks and gathering additional data, across operations.

The bottom line is, while many companies today have taken the step of assessing their most critical sustainability issues, they've often underinvested in building the data foundation to understand their real impact on these issues and effectively manage them. Rather than just tracking single impacts, like carbon emissions, they also need to account for impacts on biodiversity, water usage, habitat and other natural resources. This means augmenting their sustainability strategy with a data strategy that tracks several relevant impacts and provides dashboards customized to different user groups.

Such dashboards should contain the relevant KPIs and methods to measure the most important impacts, and visualize what information would be most necessary to compel different user groups to act. Each important decision-maker—whether energy or procurement manager—should have their own sustainability dashboard to navigate their actions and move the needle on the impacts they influence.

As data and knowledge advance, businesses will need to continually and regularly revisit and reassess their baselines, targets, plans and reporting, as well as improve the granularity, accessibility, reliability and flexibility of the data on which those targets and plans are based.

Even as these more complex endeavors are unfolding, businesses also need to turn their attention to the areas outside of their own four walls. It is essential to use this internal operations work—and particularly the data foundation—as a platform to broaden the scope and elevate the sophistication of sustainability initiatives to open new opportunities and drive a wider and more significant impact.

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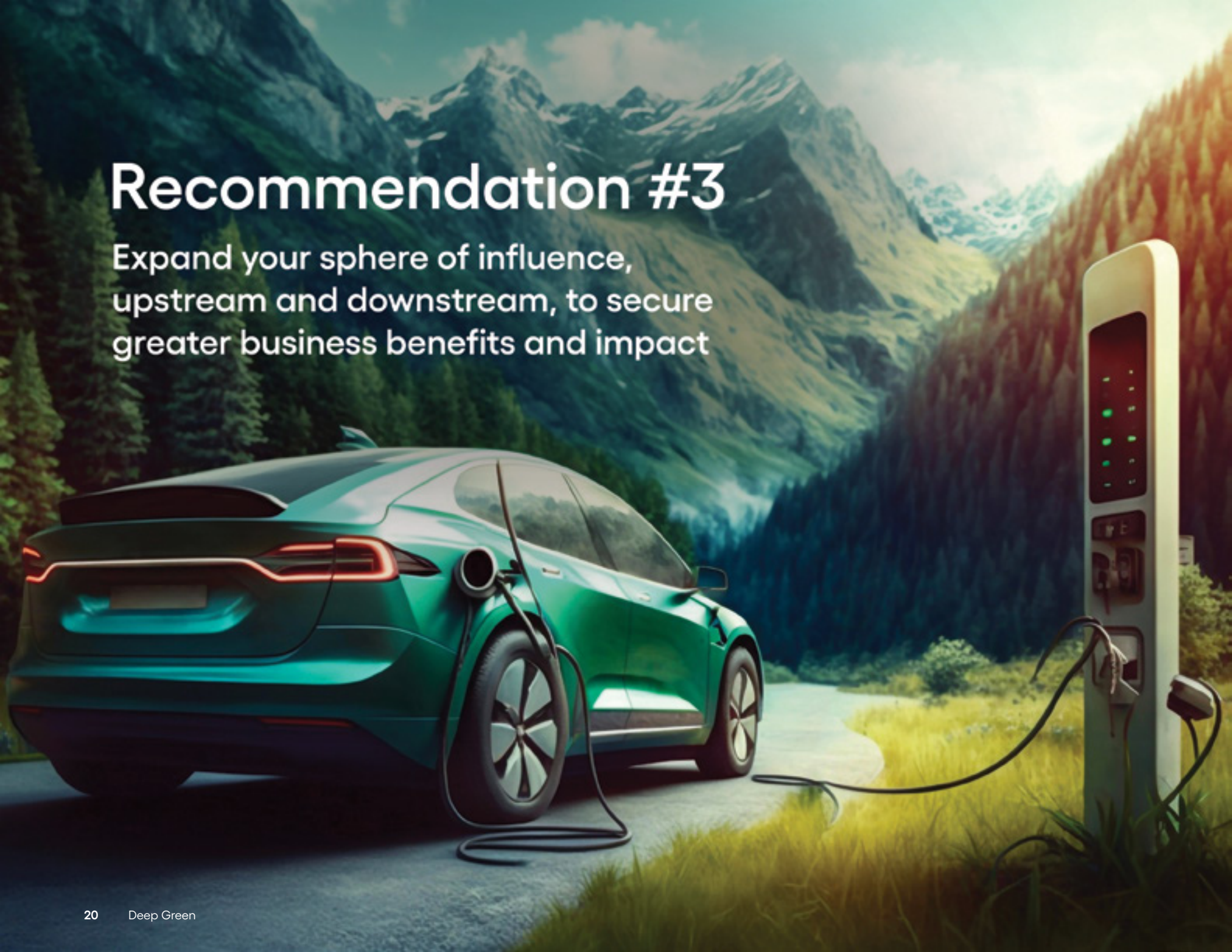


# Recommendation #3

## Expand your sphere of influence, upstream and downstream, to secure greater business benefits and impact

## 3 Expand your sphere of influence, upstream and downstream, to secure greater business benefits and impact

It's easy to see why fewer respondents are currently engaged with sustainability initiatives focused on their supply chain, products and services, and Scope 3 emissions. Doing so requires businesses to expand their efforts into areas that, until now, seemed completely out of reach.

With a solid data and advanced analytics foundation in place, combined with other increasingly sophisticated and mature technology capabilities, however, they have the tools to break through the walls of their organizations to see and shape environmental impacts, mitigate risk and discover new opportunities throughout the value chain.

Make no mistake, the collaboration, transparency and information sharing involved will require new, disruptive ways of leading and operating that may change organization structures and even business models. While this challenge is bound to come with growing pains, it's also a golden opportunity for leading organizations to move into richer and potentially more lucrative relationships with their partners, suppliers, distributors, communities, competitors and customers.

There are two broad categories of externally focused sustainability initiatives: upstream and downstream. Downstream activities encompass the product design itself and what happens when the product is in the customer's hands. Upstream initiatives focus on the intricate and extensive supply chains, logistical operations and partner ecosystems that form the backbone of contemporary global business.

The collaboration, transparency and information sharing involved will require new, disruptive ways of leading and operating that may change organization structures and even business models, but it's a golden opportunity to move into richer and more lucrative relationships.

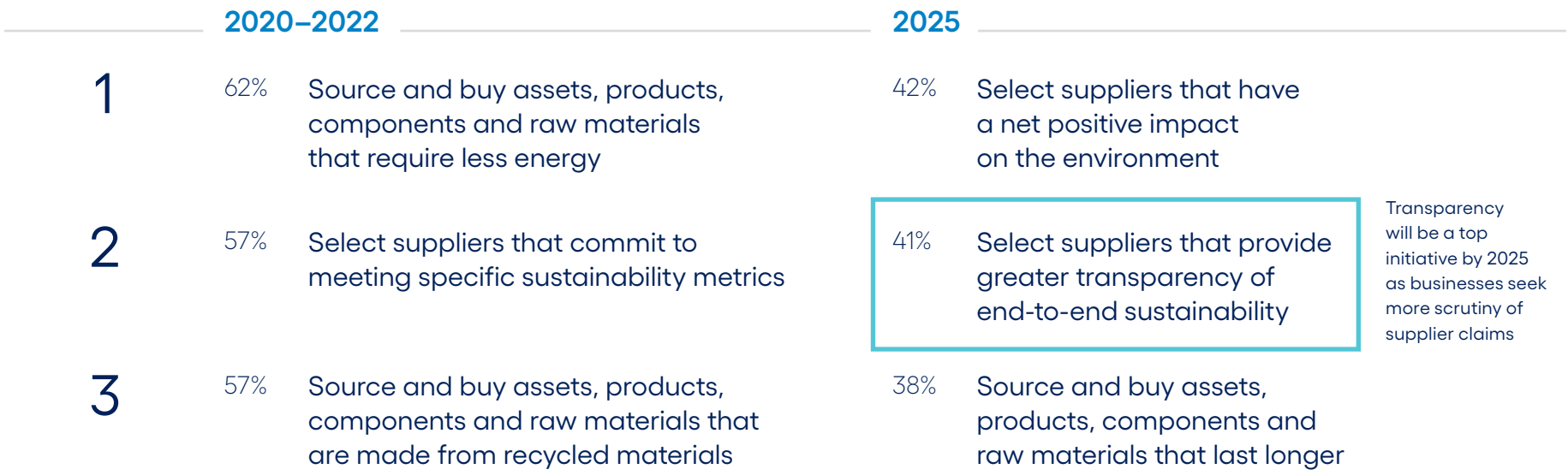
In our study, the top three actions respondents are taking today to improve supply chain sustainability include working to responsibly source raw materials and components, and selecting suppliers committed to meeting specific sustainability metrics (see Figure 7).

More than half of respondents (57%) say they've already started on these types of initiatives. But for these activities to be truly effective, the suppliers themselves would need to be counted on to accurately monitor, measure and report on their environmental impacts.

**Figure 7: Transparency will be key to reaching supply chain sustainability goals**

Q: When did you start, or when do you plan to start, implementing the following initiatives related to improving the sustainability of your supply chain?

## Top 3 initiatives




Source: Cognizant Research
Base: 3,000 senior executives

> If there are residual emissions from actors in your supply chain or in your own four walls, and you can't eliminate them, then you have to actively put together projects that will get you there.

**Survey respondent**
Senior leader, manufacturing sector

In other words, these actions don't take into account the ability to see what's behind suppliers' claims—the actual data-based evidence that shows how those metrics and conclusions were arrived at. That level of scrutiny would require full transparency into the supplier's environmental impacts, something that isn't on the top-three list and that only 38% of respondents are currently engaged in.

This inconsistency could pose a risk for businesses, leaving them vulnerable to greenwashing claims (whether intended or unintended), embarrassing revelations and potential financial regulatory penalties. For example, fashion industry supply chains are notoriously fragmented, with numerous touchpoints from multiple sourcing materials and locations, multiple manufacturing stages and a wide range of products whose production requires many suppliers and sub-suppliers across the world.

This fragmentation creates silos and a lack of a common data language within the supply chain. Various organizations follow different data collection processes and different measurement units that undoubtedly diminish the credibility of the data. Improving accuracy and transparency will require data governance and standardization, continual supply chain monitoring, robust reporting systems, regular stakeholder engagement and a transparent corporate culture.

By 2025, supplier transparency reaches the number two spot on supply chain sustainability endeavors. To gain these insights, businesses will need new levels of cooperation and coordination with their supply chain partners, and new trusted and secure mechanisms, such as distributed ledgers (blockchain), for both sharing data-driven insights and metrics and modeling out possible scenarios.

> “Brands owe it to themselves to be honest and transparent and share their journey. I’ve repeatedly heard customers and consumers saying, ‘We don’t expect you to be perfect; we expect you to be honest.’ ”
>
> **Survey respondent**
> Senior leader, US manufacturer

For example, businesses are combining automation with RFID (radio frequency identification), blockchain technologies and analytics to track materials and products throughout their lifecycle, from extraction and production to use and disposal. By doing so, they can identify opportunities for reusing and recycling materials and ensure that waste is properly managed.

Logistics and transportation is another area where transparent operations are attainable. Using location technologies, analytics and AI, businesses can reduce waste by optimizing delivery routes, reducing the need for packaging and lowering the carbon footprint of transportation.

It’s essential to engage suppliers, distributors and others in the value chain as partners, collaborating with them and seeing the sustainability journey as a shared one. Forward-looking businesses will also be open to atypical partnerships to help them reconceive products and services that they can develop, integrate and deploy to grow with sustainability.

> “We have started a project to collaborate with blockchain service providers, where a blockchain node will record our CO2 emission data and energy consumption in a certifiable and secure way.”
>
> **Survey respondent**
> Senior leader, Spanish insurer

Downstream activities encompass the product design itself and what happens when the product is in the customer's hands. Our study indicates a relatively lower degree of activity in these downstream activities compared with initiatives focused on internal operations and upstream endeavors (see Figure 8).

In fact, fewer than half of respondents are engaged in even the top three downstream activities named: using recycled materials (49%), helping customers save energy (43%) and ensuring a net positive impact on the environment (39%). Downstream initiatives are particularly challenging when they involve influencing and controlling decisions once "the cat is out of the bag"; that is, when the product or service is in the hands of the customer.

**Figure 8: Circular and XaaS models will drive product/service sustainability**

Q: When did you start, or when do you plan to start, implementing the following initiatives related to improving the sustainability of your products and services?

## Top 3 initiatives

| | 2020–2022<br>Products and services that: | | 2025<br>Products and services that: | |
|---|---|---|---|---|
| 1 | 49% | Are made from recycled materials or are made to be easily recycled | 42% | Use design thinking to reimagine products |
| 2 | 43% | Help customers save energy or use renewable sources | 41% | Are based on sharing business models |
| 3 | 39% | Have a net positive impact on the natural environment | 40% | Include advice and support to aid consumers in using products and services more sustainably |

The top three initiatives will lead to new ways of doing business with circular and XaaS models

Source: Cognizant Research
Base: 3,000 senior executives

> We launched our first sustainability-linked loan to help our partners and other small-scale businesses grab the opportunity to reduce their carbon footprint.

**Survey respondent**
Senior leader, financial services

Ever increasing regulatory and public scrutiny makes it mandatory for executives to take control of downstream impacts. As seen with the widely publicized video of a few years ago, when researchers tried to rescue a turtle that had ingested a plastic straw, it's clear that it's the manufacturers and sellers of products that are held accountable, not the consumers who dispose of the item improperly.

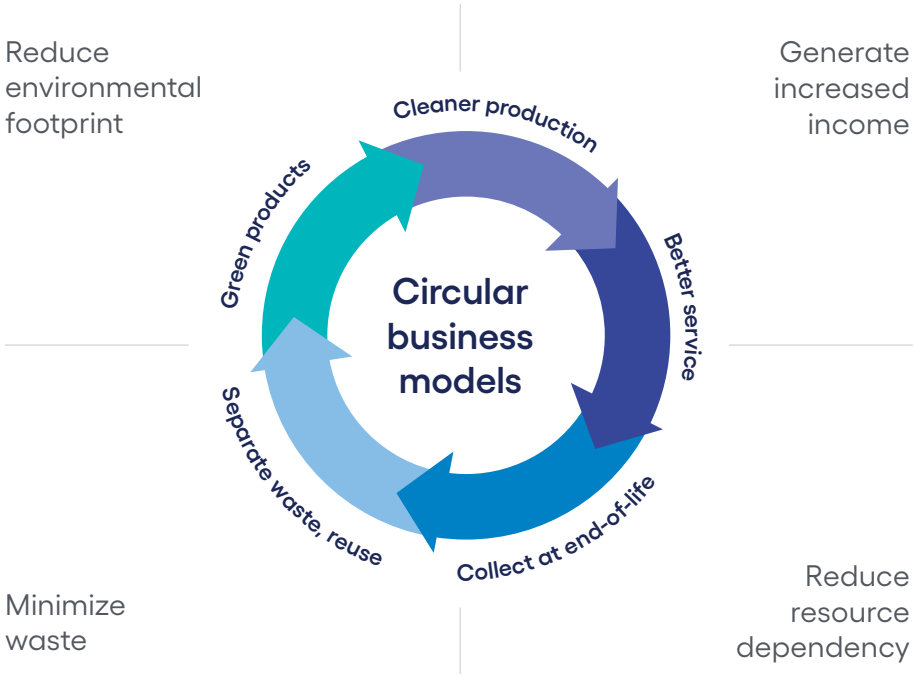
Between now and 2025, the number-one downstream activity will shift from using recyclable materials in products to completely re-imagining product design. This involves exploring innovative solutions, such as new materials and sustainable packaging, to create a closed-loop system that eliminates waste and reduces environmental impact. These types of circular business models focus on designing out waste, retaining the use of products and components, and returning materials to the product lifecycle, thereby building economic, natural and social capital. For example, waste at one end of a value chain could be fresh input for another (using worn-out car tires to make padded floors in a children's playground, for instance).

In addition, respondents intend to work directly with consumers to educate, advise and incentivize them on making a positive impact on the environment. Doing so will require a deeper understanding of how products are being used by outfitting the products themselves to convey that information. These new insights will, in turn, support new business and operational models such as "everything as a service" (XaaS) and circular business models.

Because XaaS models enable tracking, measurement and usage details, they open the door to new commercial models based on proactive and predictive services that enhance product performance, extend asset life cycles and enable customer and supplier collaboration. A lighting maker, for instance, offers an as-a-service offering through which customers pay for the lighting product only while they use it. At the end of the contract, the company reuses and recycles the products. As a result, customers achieve zero waste, and the company gains a new channel for service and maintenance revenues.

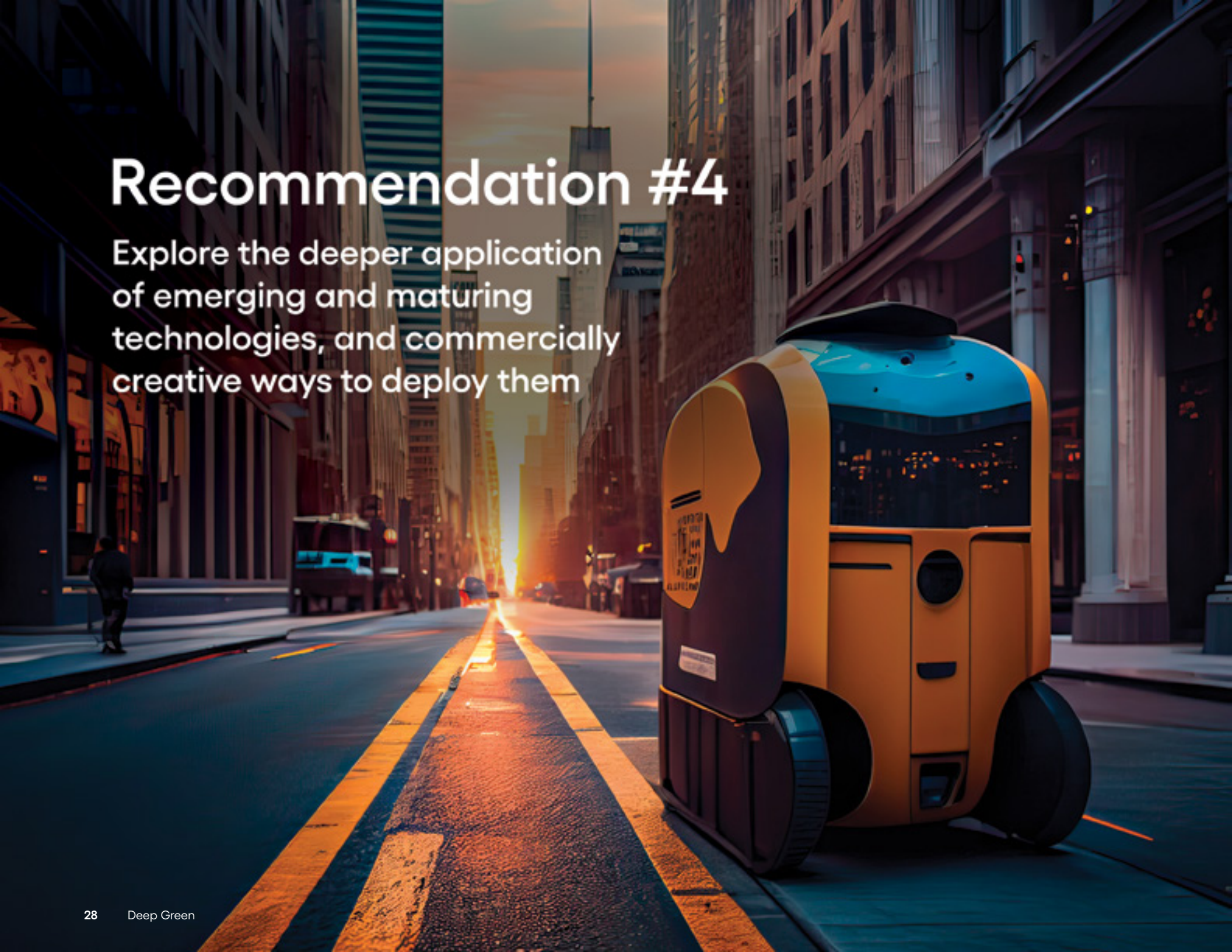
In both XaaS and circular business models, the expansion of influence establishes sustainable practices throughout the value chain. Fortunately, the tools necessary for achieving these innovative approaches are more accessible than many business leaders may realize.

By 2025, the number-one downstream activity will be completely re-imagining product design.



# Recommendation #4

## Explore the deeper application of emerging and maturing technologies, and commercially creative ways to deploy them



## 4 Explore the deeper application of emerging and maturing technologies, and commercially creative ways to deploy them

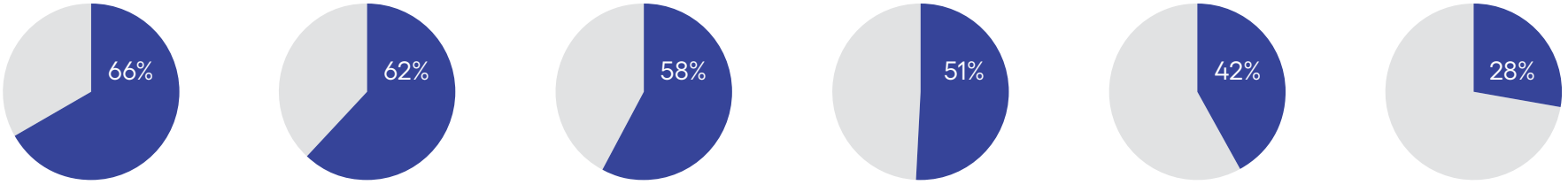
There's no doubt that technology is the key to supercharging the sustainability engine behind both internal and external endeavors. It's fair to say, in fact, that today's sustainability needs and opportunities are arriving just as key technologies such as AI, blockchain and digital twins are reaching more mature and widespread use. Such advanced technologies are integral to both expanding sustainability into a larger ecosystem and creating products and services that help solve environmental problems rather than just mitigate issues.

In our study, respondents have implemented a wide range of technologies to support their sustainability initiatives (see Figure 9). Over half of respondents have deployed a core set of technologies—cloud/edge, IoT, artificial intelligence/machine learning (AI/ML) and big data analytics—that can now be considered table stakes.

**Figure 9: Core technologies are seeing widespread use**

Q: Which of the following technologies have you implemented to improve your environmental sustainability?

### Top 6 technologies implemented today




Source: Cognizant Research
Base: 3,000 senior executives

For example, many businesses are migrating to more energy-efficient cloud environments and away from on-premises data centers—which, according to some estimates, account for 2% of global GHG emissions. It's not unusual, in fact, to see businesses reduce the data center footprint by 25% by migrating to cloud. The leading cloud providers, too, are working to bring their services to clients in increasingly sustainable ways—making the workloads migrated out of data centers more environmentally friendly.

Another example is the use of analytics technologies—driven by AI and ML—to correlate the many and various sustainability variables and get new insights into steering interventions for maximized benefits and minimized cost. With new tools, it's not only CIOs who can understand and use these sophisticated technologies; everyone from product managers to the C-Suite can focus on system outcomes and not the inputs.

Even more revealing, however, is a look at which technologies respondents cite as having been most effective at driving environmental sustainability (see Figure 10). It's not surprising that five of the six technologies most widely implemented by respondents were also in the top six most effective technologies. But the research does reveal two unexpected findings.

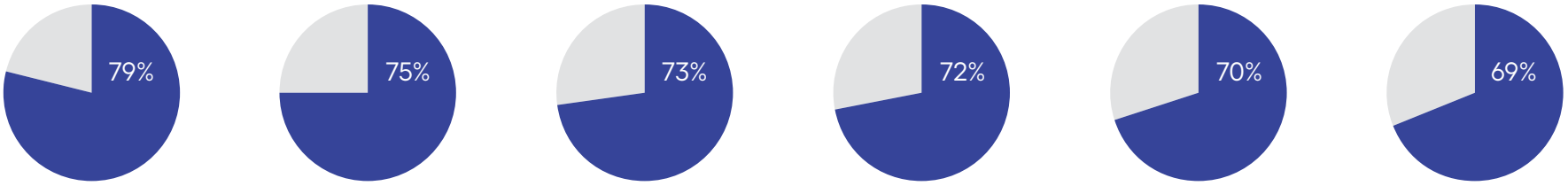
One of these stand-out findings is the wide gap between the percent of respondents using intelligent process automation and robotic process automation (IPA/RPA) (42%) and the percent citing it as effective or highly effective in advancing their sustainability strategy (79%). In fact, IPA jumps from the top five most implemented technology to the number one in effectiveness.

This is primarily because intelligent automation tools can greatly enhance internal operations, leading to greater efficiency and thus, sustainability. Further, by leveraging these insights into internal efficiencies, and applying them to processes upstream and downstream, businesses can also collect and organize data from sources that were previously inaccessible or too labor-intensive to manage. Examples include handwritten documentation from suppliers, or the collation of data relating to customer behavior.

**Figure 10: Bold tech decisions pay off with high effectiveness scores**

Q: How effective has each technology you've implemented been in improving your environmental sustainability? (Percent of respondents naming each as effective or highly effective)

## Top 6 most effective technologies today




IPA jumps from the top five most implemented technology to the number one in effectiveness

While blockchain doesn't make it to the top-six list of technologies used, 73% of those who've implemented it are convinced of its effectiveness

Source: Cognizant Research
Base: 3,000 senior executives

A second standout technology is blockchain. With just 26% of respondents having implemented this technology, blockchain doesn't even make it to the top-six list. However, 73% of those who've implemented it are convinced of its effectiveness, boosting it to number three of the top six most effective technologies.

A key benefit of blockchain is its public ledger of immutable records. This highly secure and "trustless" technology provides transparency between suppliers and customers regarding everything from the origin of components and ingredients used in products, to their journey through the supply chain, all without revealing competitively sensitive information. Food companies from Bumble Bee Foods to Nestle use blockchain technology to share information on ethical sourcing and the environmental impact of producing the end product.

**73%**

Of those firms that have implemented blockchain are convinced of its effectiveness

The somewhat low percent of respondents using blockchain could partly be attributable to its relatively new emergence into the enterprise world and, in some cases, the negative connotations stemming from its association with "crypto" activities. It's also true that some forms of blockchain can be detrimental to the environment due to their power usage, but low-power alternatives have no greater impact on the environment than other technologies and can be powered by renewable energy sources.

**62%**

Think more significant tech advances are needed. But in actuality, the technology needed for sustainable initiatives is here today

Another technology notable for its usage versus effectiveness gap is digital twins, which are virtual representations of physical things, from tech infrastructures to factories. Although they're used by just 8% of respondents, 40% of them say digital twins are effective or highly effective.

In particular, digital twins hold much promise for supporting upstream and downstream sustainability initiatives. By creating them, businesses can test and reconfigure their (real) supply chain or logistics networks to slash their carbon emissions, redesign their water management systems and realize more responsible sourcing strategies. By developing digital twin ecosystems, businesses and other stakeholders can model the impacts of their decisions on areas of the economy far beyond their immediate value chains.

In our survey, well over half of respondents (62%) believe that yet more significant technological advancements are needed to achieve net-zero ambitions. But from what we're seeing, the technology is already here—there's no "magic bullet" solution that's yet to emerge.

Instead, what's needed are the bold decisions to move into new technology areas that are showing high rates of effectiveness now and that can support the more complex endeavors involved in managing Scope 3 emissions. By doing so, businesses can expand their sphere of influence and promote collaboration and transparency throughout the value chain.

# Recommendation #5

## Evolve power structures to allow for necessary shifts in culture and accountability

## 5 Evolve power structures to allow for necessary shifts in culture and accountability

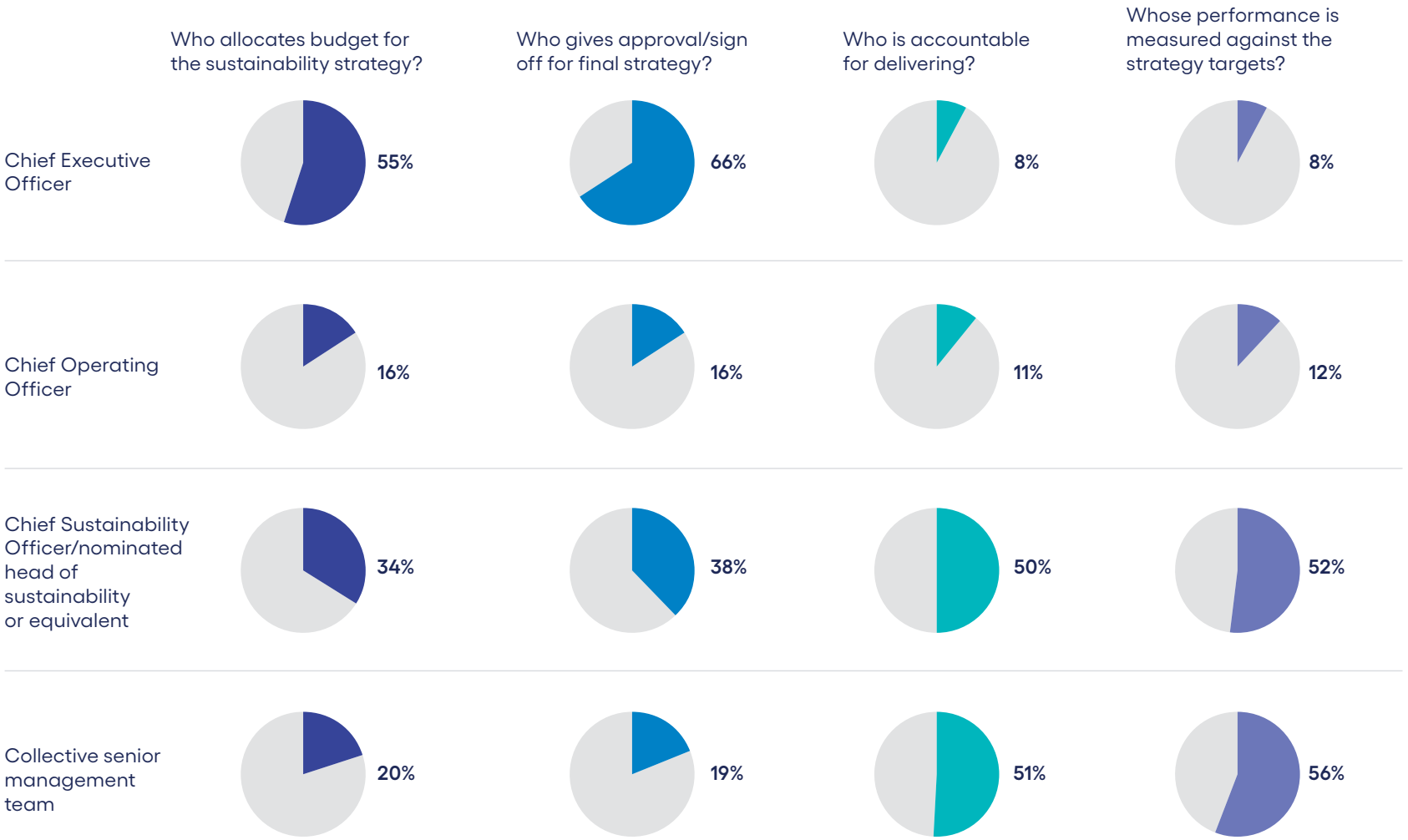
Becoming sustainable to the core—deeply green—is a full-company endeavor that will impact all levels and areas of the business. Essentially, no aspect of the business will be untouched. It's a top, down and sideways undertaking to shift from doing business more sustainably to being a sustainable business.

It barely needs to be said: Sustainability strategies are only as effective as the business's ability to deploy them. This means strategies need to be sufficiently funded and clearly communicated. It means everyone in the organization is aware of their role and incentivized to fulfill it. It means investing in the right talent and preparing the ground for the often-profound organizational change that will be necessary. And it means the people held accountable for achieving strategic sustainability goals are the ones empowered to make the bold decisions and disruptive changes needed to achieve expected outcomes.

But that's not what we're seeing in our survey data. When we asked respondents to describe the responsibility and accountability structures in their organization, the resulting power equation appears out of balance. For the majority of respondents, it's the top of the organization—the CEO—who creates and signs off on the strategy and allocates budget. As would be expected, the responsibility for executing the strategy cascades down to the lower levels of the hierarchy, such as the chief sustainability officer (CSO), senior managers and department or functional managers.

## Figure 11: New leadership models are needed

Q: How is responsibility and funding for your environmental sustainability strategy spread across your company?




Source: Cognizant Research
Base: 3,000 senior executives

What's misaligned, however, is who in the organization is held accountable for their performance in reaching the strategic sustainability goals. Rather than the strategy creators (usually the CEO) and budget approvers (CEOs and CFOs) taking ownership for the strategy's outcomes, it's the CSOs and senior managers whose performance is measured against meeting sustainability targets. Only in a tiny minority of cases is the strategy creator's performance tied to sustainability goals (see Figure 11).

This is not to say that the senior manager and CSO roles should not be held accountable but that the accountability should be more evenly shared. This will require leadership models to evolve.

While the power structure is more balanced when it comes to the CSO's role—with a more even ratio of responsibility for strategy creation and sign-off and accountability—the balance still seems misaligned. With 60% of study respondents seeing an increased demand in their organization for creating a dedicated CSO role, it stands to reason that the CSO should be empowered with the authority and resources to champion sustainability initiatives at the same level as their C-suite peers.

With this organizational misalignment, it's no wonder that, when asked to name the top challenges of setting and achieving their sustainability goals, respondents' top responses were all indicative of this imbalance of strategy and accountability. The challenges respondents named include a lack of alignment between different business units and stakeholders, lack of strategic clarity, and a lack of awareness, skills or broader understanding of sustainability—all named by over one-third of respondents (see Figure 12).

**Figure 12: Revised power structures will solve key challenges**

Q: Which of the following internal challenges inhibit progress toward setting and achieving your environmental sustainability goals the most?

**39%**
Lack of alignment between different business units and stakeholders

**35%**
Lack of awareness, skills or broader understanding of sustainability among staff

**31%**
Mature technology solutions suitable for our business are not available

**30%**
Inflexible and inefficient business processes

**38%**
Lack of strategic clarity of environmental sustainability roadmap

**33%**
Lack, scarcity or high cost of specialized talent required to execute strategy

**31%**
Specialized technology required is too expensive

**30%**
Difficulty collaborating with suppliers

Source: Cognizant Research
Base: 3,000 senior executives

Lack of skills—named as a top-three challenge—is emerging as a particular concern for businesses that aim to lead in sustainability. Businesses must first recognize the competencies needed to build a climate-smart workforce and then make training available to every employee on a role-by-role basis. Good curriculum already exists for basic climate literacy and position-specific training, so this can readily be done.

The fact is, the entire workforce needs to share responsibility for realizing sustainability goals. Businesses need to ensure everyone is aware of sustainability goals and is motivated to contribute to them. While sustainability ambassadors are vital, it will take a wide array of people in the organization to build, share and monitor baselines, targets and plans.

For this reason, incentive systems are key to reward those who fulfill their responsibility in meeting sustainability targets. In our study, only 32% of the participants reported incentivizing employees at all levels to improve sustainability in their workplace. However, a significant 71% of the respondents identified incentivization as the most effective method for promoting a cultural shift towards sustainable practices.

With a structural rebalance of power, a reskilling of the workforce and employee empowerment, senior leaders will have the pieces in place to inspire the rest of the business to embody a culture that values incorporating sustainability into every aspect of operations, partnerships and products.

# Final word

# Final word

The world has awakened to the dire needs of our planet, its resources and the diverse forms of life that populate it.  And for businesses, that means finding a path forward—far beyond "business-as-usual"— to an as-yet undefined way of producing goods and services that meet both economic and environmental needs.

We feel sure that businesses will find that path. Driven by ingenuity, a collaborative spirit and the courage to change, business leaders will meet the call for radical transparency, authenticity and resilience, in tune with the prevailing winds of change.

In the name of sustainability, we will see these businesses put aside old competitive tropes to form atypical partnerships, creatively deploy emerging and maturing technologies, and boldly seek commercial differentiation from their sustainability leadership. The pieces and parts are there—it will be the winners who assemble them.

What you do next as a leader is critical. Whatever path you take demands humility, open-mindedness, and a willingness to partner to address the complex and interconnected challenges of the day. It won't be long before the ideas of "sustainability" and "business" become one and the same, as the two become intertwined in a deeply green world.

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# Methodology

Cognizant commissioned Oxford Economics to design and conduct a survey of 3,000 C-suite and senior executives, including individuals at the C-suite and VP levels, from large corporations around the world. Our focus was on those who play a significant role in shaping, contributing to or making final decisions on their organization's environmentally sustainable operations. The survey was conducted between Q4 2022 and Q1 2023 via computer-assisted telephone interviewing (CATI).

Respondents were evenly distributed across the following geographies and industries:

**Geographies**

- North America (US and Canada)
- Europe (UK and Ireland, France, Germany, Switzerland, Belgium, Luxembourg, the Netherlands, Denmark, Finland, Norway, Sweden, Italy and Spain)
- Asia Pacific (Singapore, Australia and UAE)

**Company size**

All respondents were from organizations with over $250 million in revenues.

- 10%: $250 million to $499 million
- 10%: $500 million to $999 million
- 80%:  $1 billion or more in revenue

**Industries**

- Banking & capital markets
- Food & agriculture
- Insurance
- Life sciences
- Manufacturing & automotive
- Retail & consumer goods
- Telecommunications & technology
- Transportation & logistics
- Energy & utilities
- Media & entertainment
- (A smaller group was from the public sector)

In addition to the quantitative survey, Oxford Economics conducted 24 in-depth interviews with executives across the countries and industries surveyed. The conversations covered the major themes in this report, providing real-life case studies on the challenges faced by businesses and the actions they are taking. The resulting insights offer a variety of perspectives on sustainability initiatives.

## Cognizant Research

At Cognizant Research, we help leaders make sense of today's volatile socio-economic climate. We bring quality research and insights rooted in Cognizant's deep industry and technology expertise, helping leaders make the decisions that fuel their companies' success. Visit us at **cognizant.com/us/en/insights/sustainability-resilience.**

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