



Deep Green

How manufacturers can accelerate
the sustainability agenda

Our recent study shows where manufacturers need
to focus to better meet their sustainability goals.





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Introduction

Manufacturers know sustainability is a business necessity. Regulators and consumers across the globe increasingly demand that manufacturers' internal operations, business practices and the goods they produce meet stringent sustainability standards.

This reality is reflected in our recent study of 3,000 senior executives from around the world, including 295 from the manufacturing industry. In the study, 70% of manufacturers said environmental sustainability is highly or very highly important to their business strategy (see Figure 1). (Click [here](#) to read our full cross-industry report, "Deep Green: How data, technology and collaboration will drive the next phase of sustainability in business.")

Yet it might seem like an impossible balancing act to implement sustainable practices while controlling costs and delivering high-quality goods at competitive prices. The fact is, only 44% of manufacturers in our study told us they had met their own sustainability targets over the last two years.

Figure 1: A gap between ambition and reality

70%
said environmental sustainability is highly or very highly important to their business strategy.

44%
said they had met their sustainability targets over the last two years.

Base: 295 manufacturing executives
Source: Cognizant Research

So even as sustainability is seen by most manufacturers as a business mandate, many have yet to take key steps to create sound sustainability practices that also deliver good business results (see Figure 2).

Figure 2: Low interest in key practices

60%
did not think it was highly or very highly important to have an independent assessment and validation of their company's environmental performance.

56%
did not think it was highly or very highly important to establish a robust baseline against which to measure their company's sustainability initiatives.

Base: 295 manufacturing executives
Source: Cognizant Research

Without a clear understanding of where to apply their efforts for greatest return, it will be difficult for manufacturers to make meaningful sustainability progress, let alone align those efforts with business objectives.



Tackling the cost question

Cost is the first issue that springs to mind when it comes to sustainability and manufacturing—controlling costs is a manufacturing metric carved in bedrock.

If the cost of producing sustainable goods is significantly higher than traditional methods, manufacturers may not be able to absorb the increases, and consumers may not be willing or able to pay.

This unwelcome “green premium”—a term coined by Bill Gates to describe the additional cost of using sustainable technologies—however, will ultimately disappear in the coming years and decades, for two reasons. One, as green tech investment gives rise to new green innovation ecosystems and consolidates existing ones, the costs of addressing environmental harm will fall.

Two, as more countries put a price on carbon, fewer manufacturers will be able to

gain advantage by producing in jurisdictions with low or no carbon prices. The world currently has 73 carbon pricing schemes (including both carbon taxes and emissions trading programs), covering around 23% of global emissions, according to a recent [World Bank report](#).

In October 2023, the EU began the gradual implementation of its Carbon Border Adjustment Mechanism (CBAM), an import tax on carbon-intensive products designed to address carbon leakage. In the US, a bipartisan bill to calculate the emission intensity of goods imported from different countries could be the first step toward a US CBAM.

In addition to cost concerns, we’ve identified three separate but interconnected challenges for manufacturers to overcome as they pursue a more sustainable way to operate and produce goods.

“Environmental sustainability will continue to remain as important, if not more important. As your investor base or other stakeholders become savvier, they ask critical questions. They are only going to be expecting this and more.”

US-based senior executive at an industrial manufacturing firm

Challenge #1

Boost management
support for sustainability



Boost management support for sustainability

While manufacturing executives have ambitious goals that reflect the critical role of sustainability in business success, the use of common management tools to support these objectives needs to be greatly improved (see Figure 3).

Figure 3: Low use of common management tools

18%

offer incentives or reward managers for achieving environmental targets. And yet, respondents who do provide incentives and rewards said these mechanisms were highly effective.

48%

adopt targets or set budgets for planned improvements to their environmental initiatives.

49%

report timely and/or reliable data on the performance of their sustainability initiatives.

Base: 295 manufacturing executives
Source: Cognizant Research



Boost management support for sustainability

Our research also reveals that—for over one-third of respondents—many of the challenges impeding sustainability efforts could be overcome with more adept and involved management (see Figure 4).

Figure 4: Top challenges are management-related

Q: What are the top challenges to improving sustainability outcomes?

38%

lack of alignment between business units and stakeholders.

34%

lack of awareness, skills or broader understanding of sustainability.

34%

lack, scarcity or high cost of specialized talent required to execute strategy.

Base: 295 manufacturing executives
Source: Cognizant Research

By mapping sustainability to the business strategy and specific product lines, managers can ensure all levels of the organization understand how their sustainability initiatives and programs contribute to business objectives. An example is consumer goods giant Unilever, with its Compass Strategy for Sustainable Growth.

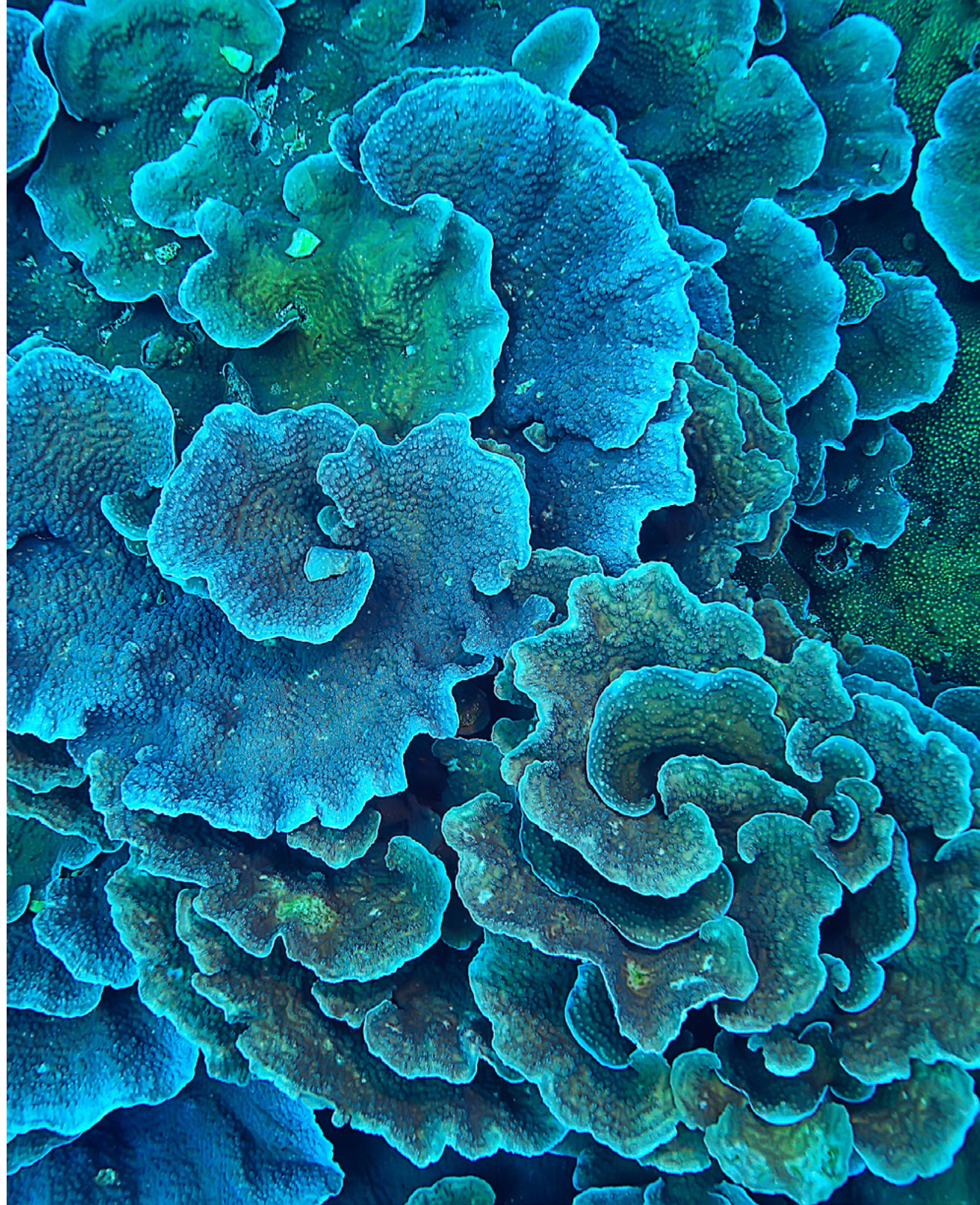
In its 2022 annual report, Unilever says it has cut approximately €1.5 billion in costs since 2008 as a result of increasing the efficiency of its energy and water use in its factories. Its water stewardship program has offset the risk of having 40% of its manufacturing sites in water-stressed areas, resulting in savings of 1.9 trillion liters of water in India alone.

The company credits its sustainability measures with driving some of the double-digit growth in its leading brands in 2022. The company was quick to point out in its annual report that year that the real test is being able to commercialize the sustainability investments it's made and show that sustainable business is a pathway to better performance.

Recommendations

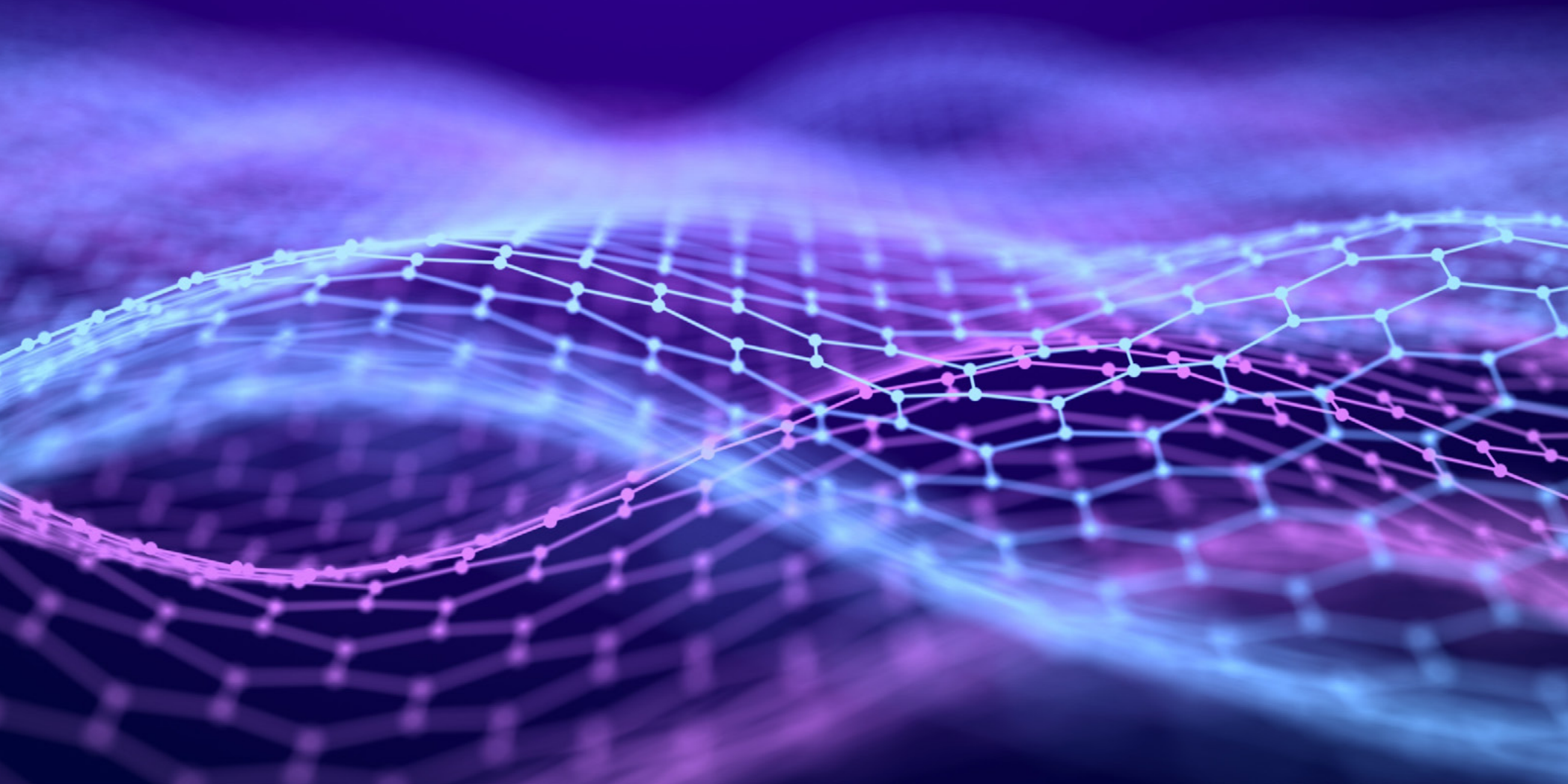
- **Engage senior leaders in coordinating sustainability efforts** among different areas of the company, such as by appointing sustainability champions in different departments who will be accountable for progress.
- **Develop appropriate incentives and rewards for sustainability ideas** and progress throughout the organization.
- **Train all personnel in sustainability skills**, with an eye toward applying manufacturing ingenuity to solve sustainability challenges.

For example, one manufacturer's new digital tracking system could not read the analog data produced by older machines. Instead of an expensive, disruptive rip-and-replace solution, the managers pointed a camera at the analog dials, recorded a video and then fed that content into AI software that translated the analog input into digital outputs the tracking system could analyze. Problem solved—with little downtime and only minimal cost.



Challenge #2

Overcome technology timidity



Overcome technology timidity

It seems a foregone conclusion that data and digital technologies are key to manufacturers' ability to raise their sustainability game. And yet, less than half of manufacturing respondents in our study (46%) agree that their companies' technology projects deliver targeted improvements in environmental sustainability.

Further, while nearly 50% or more of manufacturing respondents said they have implemented four key technologies listed in our study (see Figure 5), the adoption of big data analytics in particular seems low, especially considering its use in generating insights to meet both business and sustainability goals. The Society of Manufacturing Engineers (SME) notes that manufacturers could use data and analytics to minimize waste, reduce raw material costs and manage energy use to create lean and sustainable operations.

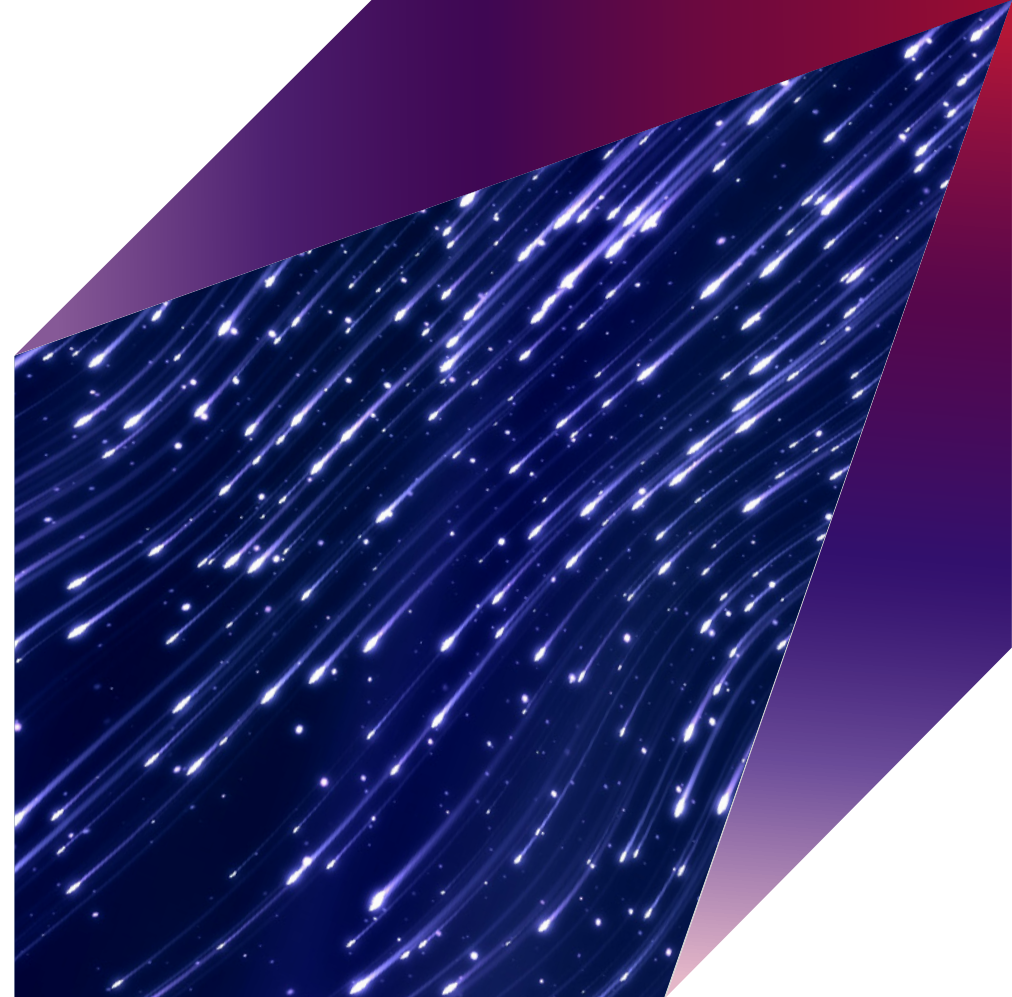
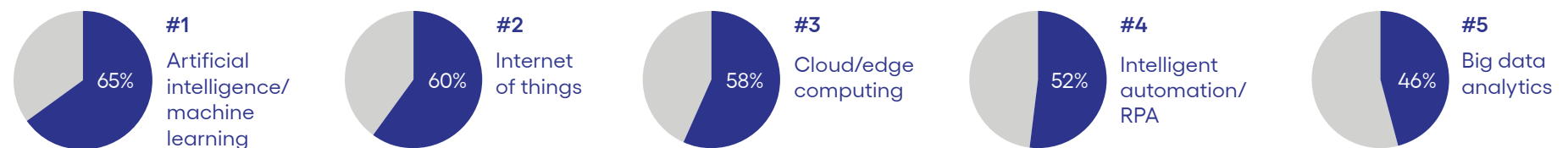


Figure 5: Top 5 most implemented technologies

Percent of respondents who have implemented each technology to improve sustainability performance



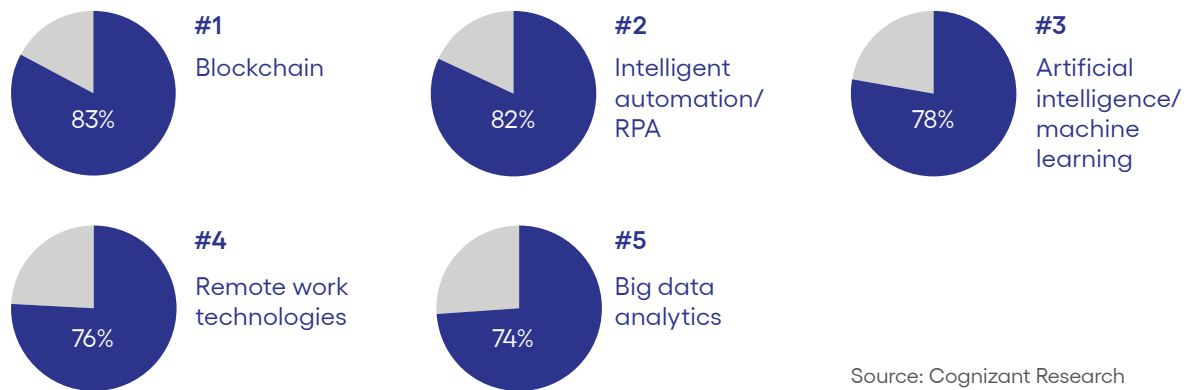
Base: 295 manufacturing executives
Source: Cognizant Research

Overcome technology timidity

In fact, respondents confirmed that some of the less used technologies—including analytics—were also some of the most effective when it comes to supporting sustainability programs and initiatives (see Figure 6).

Figure 6: Top five most effective technologies

Percent of respondents that use these technologies for sustainability purposes saying each is effective or highly effective in improving performance in this area.



Source: Cognizant Research

The most effective technology named by manufacturing respondents for improving sustainability performance in our study was blockchain. With just 18% of manufacturing respondents having deployed this technology for sustainability reasons, blockchain does not even make it to the top-five list of most implemented technologies. However, 83% of those who have implemented it are convinced of its effectiveness, boosting it to number one of the top five 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.

Global sportswear company Adidas is using blockchain to [improve its supply chain visibility](#) down to the materials level in hopes of identifying and reducing waste by verifying goods shipped against materials ordered.

AmBev, the brewery giant, [uses blockchain](#) to connect to farmers, in part to increase traceability and to gather data to improve farmers’ sustainable use of natural resources while improving crop yields.

“ One of the first things I did when I joined my company was set up an ESG insights platform. We have a dashboard that shows, within a month or a quarter, how we are doing in terms of some of our energy, waste or water goals. We have a fairly good sense of where we are; there is always room to improve, but digitizing how we collect data was a key consideration. ”

US-based senior executive at an industrial manufacturing firm



Overcome technology timidity

Recommendations

- **Collect data that provides visibility into manufacturing operations**, equipment wear and energy use to optimize production and/or establish predictive maintenance capabilities. Doing so will minimize energy loads as well as material and water waste, all of which are both important sustainability elements and critical cost control points. Companies need to define measurable KPIs to understand how they are tracking against their targets.
- **Develop a comprehensive data strategy** to get greater value from the wealth of data generated by IoT. The strategy should set clear priorities for how to use the data so it can be appropriately managed, structured and stored. Ensure decisions are empowered through insightful dashboards and self-service tools, ultimately allowing managers to cut across data silos and to make sound sustainability choices with commercial acumen.
- **Build digital twins fed by production control and other data** to pinpoint process enhancements that reduce waste, cost and time-to-market. At its factory in Changwon, Korea, [LG Electronics](#) pumps real-time production data into its assembly line visualization tool, transforming it into a digital twin. The system has improved productivity by 17%, boosted product quality by 70% and reduced energy consumption by 30%.

Digital twins of heating pumps and the lighting system at [Schneider Electric's Le Vaudreuil facility](#), meanwhile, have enabled the company to reduce energy use by 25%, material waste by 17% and CO2 emissions by 25%.

Challenge #3

Increase engagement
with supply chain partners

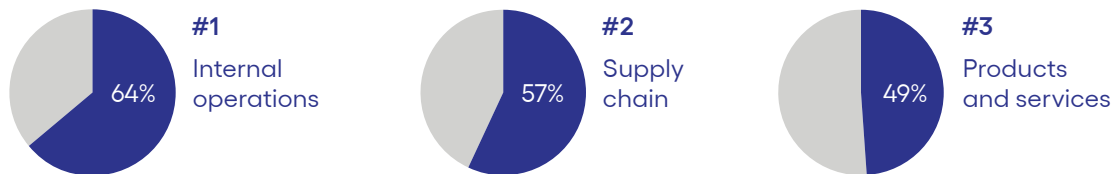


Increase engagement with supply chain partners

Achieving comprehensive sustainable practices requires cooperation and collaboration with suppliers and partners. Our research shows that while manufacturers are more focused on the sustainability of their supply chains than on that of their products and services, the majority are still highly focused on improving the sustainability of their internal operations (see Figure 7).

Figure 7: Primary focus on internal operations

Q: To what extent are your environmentally sustainable strategies focused on your company's operations, supply chain or products and services? (Percent saying to a large or very large extent)



Base: 295 manufacturing executives
Source: Cognizant Research

Most manufacturers have room to grow their influence on their supplier networks, based on their responses in our study (see Figure 8).

Tackling supply chain sustainability is not only a necessity for addressing greenhouse gas (GHG) Scope 3 regulatory requirements; it is also important for mitigating business risks associated with supply chains, such as by improving supply chain resiliency and transparency. Any environmentally unsound practice by upstream suppliers opens manufacturers to punitive regulatory action and consumer pushback. Fashion retailers know this well. The popular 2015 documentary *The True Cost* dealt a heavy blow to the reputation of fast fashion by exposing widespread environmental degradation and poor labor conditions associated with the suppliers of global brands.

Figure 8: Room for improvement in the supply chain

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

■ Have not started ■ Have started, plan to start or don't know

Select suppliers that have a net positive impact on the environment



Source and buy assets, products, components and raw materials that help improve the natural environment



Select suppliers that provide greater transparency of end-to-end sustainability



Select suppliers that have a logistics value proposition that prioritizes environmental sustainability



Source and buy assets, products, components and raw materials that last longer than comparable products on the market



Increase engagement with supply chain partners

Many leading companies require suppliers to attain specific sustainability goals and practices and monitor supplier compliance. BASF aims to have 80% of its suppliers improve their sustainability performance by 2025. Ford's [Supplier Code of Conduct](#) requires its suppliers to establish science-based GHG reduction targets, action plans and transparent reporting mechanisms, with the remit to submit the targets to the company by the end

of last year. The nonprofit climate advocacy firm Ceres reports Allbirds, Apple, AstraZeneca, Etsy, Everlane, Ford, Gap, General Mills, HP, IKEA, JLL, Mars, McCormick, Moody's, Unilever and Walmart [have made significant Scope 3 progress](#) by working with suppliers.

Manufacturers must also be ready to manage their products' downstream sustainability. Automaker Renault established in 2020

Europe's first dedicated circular economy vehicle factory. The company's approach involves implementing a reverse logistics ecosystem to extend the lifespan of products and components. A well-managed reverse logistics operation not only eliminates the need to source new raw materials but may also contribute to recycling activities as part of a circular economy materials flow. That's good sustainability and good business.

“ From a supply chain standpoint, it's also about starting to talk to your key suppliers at each manufacturing site and understanding circularity concepts or principles in your packaging and your different distribution methods. If we all, as customers, are asking our supply chains for more, we can harmonize those efforts. ”

US-based senior executive at an industrial manufacturing firm





Increase engagement
with supply chain partners

Recommendations

- **Understand where and how your own sustainability opportunities and issues overlap** with suppliers' and partners' practices to ensure sustainability mandates deliver desired outcomes. Doing so will require building on the foundational management elements discussed above, such as incorporating incentive structures, sustainability awareness training, and technology and data analysis.
- **Work with partners to design and deploy a sustainability strategy** that delivers real results both for achieving sustainability goals and making the manufacturer's operations and its suppliers' businesses run more efficiently.
- **Integrate procurement with circular strategies** to identify where growth can be fed with recycled and repurposed materials versus new and raw materials. Ingka Group, the largest IKEA franchisee, is [working toward mattress recycling](#) in Belgium, Denmark, the Netherlands, Sweden, Switzerland and the UK. It has invested in [RetourMatras](#), a company with an automated solution for recovering and transforming up to 85% of the foam, metal, textiles and wood from old mattresses. In addition to making those materials reusable for new mattresses, the process saves 76 kgs of CO2 emissions per mattress recycled versus incinerated.



Final word

We expect the concepts of “sustainability” and “best business practice” to rapidly become one and the same. As global and national economies further advance toward sustainable models, the resources dedicated to sustainability initiatives will look less like expenditures and more like investments in competitiveness. Further, regardless of short-term fluctuations in regulatory trends, the shift is unequivocally toward stricter environmental regulation.

This evolution is clearly under way in the manufacturing sector. Reducing waste, managing inventory levels, conserving water, optimizing energy use—these are all excellent business practices as well as important sustainability goals. While discussion of “stakeholder capitalism” may have eased in recent times, businesses still have an imperative to be responsible players. The only justifiable actions to take are those that make continued life on the planet possible.

The evidence is mounting that manufacturers can achieve the intertwined objectives today of good business and sustainability—if leadership champions these steps:

- **Train, challenge and reward all employees** to rethink every system, process and material from a green business perspective.
- **Take full advantage of the power of existing technology investments** by analyzing and using the data these platforms and sensors deliver.
- **Hold the organization and its supply chain partners accountable** for best sustainability practices so all share in the business benefits.

These steps will accelerate manufacturers’ transition toward being deeply green while delivering on the promise to shareholders, employees and the wider community.

About the authors



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Jonathan Smith is an AVP and Client Partner in Cognizant's Energy & Resources practice for Australia and New Zealand (ANZ). He is also the APAC Regional Lead for the Sustainability Solutions practice.

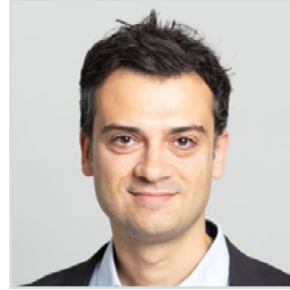
Before joining Cognizant in April 2021, Jonathan was a Managing Director with Accenture and a Partner at KPMG, where he was the National Lead for Energy and a member of the firm's Energy & Natural Resources leadership team.

With a consulting career spanning more than 30 years, he has a wealth of experience in providing advice to and leading transformations for clients in capital-intensive industries, both in ANZ and across Southeast Asia.

He has written papers on finance function effectiveness, IT function effectiveness and, more recently, on the "ESG data challenge." Jonathan holds a BSc(Hons) in Industrial Studies from Nottingham Trent University and an Executive MBA from the University of Western Australia, where he was one of three students to receive an HD for his final dissertation on how global CFOs best contribute to corporate strategy. He is a PRINCE2 Practitioner (and was part of the global review team for "Directing Projects") and a Six Sigma Green Belt incorporating LEAN. He attended Harvard Business School for the "Authentic Leadership Development" course and has completed "Strategy in the Age of Digital Disruption" with INSEAD.

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Alessandro Silvestro is Associate Director, Industry 4.0, and Sustainability Strategist at Cognizant, responsible for the Sustainability Advisory and Services practice in the DACH region. He works across markets and the EMEA region, with a primary focus on the manufacturing and logistics, automotive, life sciences and consumer goods industries.

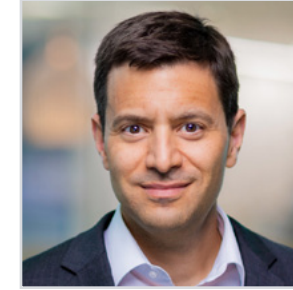
Alessandro's current focus is on scaling up Cognizant's sustainability service offerings and capabilities to its clients, enabling digital and operational transformation models to achieve triple bottom line results—people, profit, planet—and helping companies transition to sustainable end-to-end supply chains.

In his 14-plus years of experience prior to Cognizant, Alessandro delivered key operational and digital transformation projects in the automotive, consumer goods and gas industries, built greenfields and expanded or restructured brownfields in often change-averse settings.

He graduated from Politecnico di Milano in 2008 in industrial engineering and from Massachusetts Institute of Technology in 2020 in supply chain management.

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Eduardo drives sustainability and digital transformation research at Cognizant. He applies innovative and multidisciplinary methods to help organizations adapt to new trends and capitalize on emerging opportunities.

With over 20 years of experience, he was previously Head of Accenture Research for Latin America. Also a member of the MIT Technology Review Global Panel and a fellow of the Royal Society for Arts, Manufactures and Commerce (RSA), Eduardo is based in London.

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Methodology

Cognizant commissioned Oxford Economics to design and conduct a survey of 3,000 C-suite and senior executives from large corporations around the world, including 295 from the manufacturing industry. 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). All respondents were from organizations with over \$250 million in revenue.

For more on this topic, see our full report, visit our [Sustainability & Resilience](#) and [Manufacturing Solutions](#) webpages or contact us.





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