SAP

Using Technology to Illuminate the Path to Sustainability

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Introduction

Companies in major economies are facing increasing pressure to meet sustainability goals. Multiple stakeholders — investors and regulators to customers and employees — are now demanding progress. This creates a daunting challenge. To succeed, sustainability needs to be embedded across the organization, from corporate mindsets to technology strategies to innovation decisions. Every step of business decision-making and investment must account for it.

For such enterprise-wide sustainability strategies to work, we need to move beyond the days of siloed data. A new generation of sustainability technologies are being built around cloud-based central systems, aided by the latest AI, with real-time access to trusted data that has immediate impact against the value chain. Business executives already recognize the benefits that flow from advanced systems: almost three-quarters of respondents to a recent survey by Deloitte said they were likely to invest in new technology or tools to enable more timely and higher-quality ESG disclosure[1].

Through interviews with chief sustainability officers and subject matter experts, combined with the use of third-party data, this report explores how to advance from sustainability compliance to an AI-driven sustainable business strategy. It will address the following topics:

- Why sustainability requires attention from multiple C-suite stakeholders.

- Why an automated, fully integrated data system is the gold standard in sustainability.

- How to refine reporting on those hard-to-track Scope 3 emissions.

- The innovation and efficiencies that AI makes possible.

Compliance is the starting point for many sustainability initiatives and a must-do for every company. The best compliance strategies are catalysts that boost efficiencies and unlock value. Yet for many sustainability chiefs, the myriad sustainability regulations can be a challenge. Access to the data isn't always straightforward, and manually creating reports and insights from different sources

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[1] *2024 Sustainability Action Report: Survey findings on ESG disclosure and preparedness,* Deloitte & Touche LLP, July 2024.

can be time-consuming and prone to error.

In the pages that follow, we'll explain how the right technologies can turn compliance obligations into a force that accelerates progress toward a sustainable operating system that supports your business strategy.

"We have integrated sustainability considerations into our investment process and governance practices for the private equity portfolio," says Ben Saunders, principal, sustainability, Apollo portfolio performance solutions at Apollo Global Management Inc. "We are conducting sustainability diligence in parallel with operational and commercial diligence."

Organizations are investing in sustainability reporting as they recognize internal and external benefits in doing so. Greater efficiencies, lower risk and enhanced trust with stakeholders were identified by more than half of respondents to the Deloitte survey as the top benefits companies expect from investments in sustainability reporting. Brand reputation, talent attraction and higher pricing abilities top the charts for expected external business outcomes.

Christian Boos, head of sustainability innovation at SAP, observed how the approach to sustainability compliance has been evolving. "Several years back, the conversations about sustainability compliance were boiled down to reporting what's required," Boos said. "By now, most of the C-suite have understood that it's not enough to have a sustainable strategy — aimed at compliance — but what's needed is a sustainable business strategy, aimed at making sustainability a competitive advantage."

Section 1

Sustainability as a Team Sport

Perhaps because sustainability is a function that touches on multiple business lines, companies are still seeking the best way to organize the roles, responsibilities and reporting involved. In a recent survey, for example, 76 percent of companies said they are planning an organizational restructuring to better align ESG goals with overall business strategy, according to a report by KPMG[2].

Colgate-Palmolive's Chief Sustainability Officer Ann Tracy originally reported to the company's chief supply chain officer, but now reports to the group president, growth and strategy. "The change in the reporting structure illustrates how Colgate-Palmolive integrates sustainability and social impact into the company's overall strategy," Tracy said. "I orchestrate, coordinate and convene stakeholders across the company, from HR to IT to legal to packaging and beyond."

My first day on the job, I met with the board of directors and the CEO. So right out of the gate it was clear that sustainability is going to be a core component of how we do business.

Robert Bernard
Chief Sustainability Officer and Head of Client Sustainability, CBRE

SAP's Boos agrees: "Sustainability is a team sport; many players need to come together, including those beyond the boundaries of one company."

Others note a shift in the importance of sustainability projects in terms of scope and the level of executives involved. Just a couple of years ago, said Stephanie Guimbellot, Accenture managing director and global lead SAP sustainability and innovation, a typical sustainability project would involve the CSO alone, last two to three months and aim to generate a single report. "Companies wanted a fast, small solution," she said.

These days, sustainability projects are no longer one-off engagements that produce a specific compliance report, but bigger and longer-term technology investments designed to meet compliance requirements and gain a competitive advantage. As such, they require multiple, cross-functional stakeholders to be involved.

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[2] *2024 Sustainability Organization Survey,* KPMG, February 2024.

An Accenture study[3] found that shared accountability is [more common in ESG-mature companies](). Almost three-quarters of companies with three or more executives accountable for ESG have strong ESG capabilities; 14 percent of companies with one executive accountable reach the same standard.

Number of Executives Accountable for ESG Performance

Weak ESG capabilities	46% / 26% / 29%	
Moderate-level ESG capabilities	28% / 22% / 50%	
Strong ESG capabilities	14% / 12% / 74%	

Legend:
- One executive accountable for all ESG performance elements
- Two executives accountable
- Three or more executives accountable

"Early in our investment period with a new portfolio company, we emphasize the importance of cross functional collaboration and integration of sustainability into management mechanisms, so that it stays top of mind for everyone," says Apollo's Saunders. "Increasingly, over the last couple of years, we have also been incorporating sustainability into management incentive plans."

At Schneider Electric, sustainability is embedded as part of the company's culture, says Vanessa Miler-Fels, the company's VP of climate and environment. "It's a huge governance and change management process to make sure that sustainability

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[3] *From Compliance to Competitive Advantage,* Accenture, June 2024 .

becomes part of everybody's job," she says. "It requires building awareness, tools and incentives for employees to embed sustainability into their processes as easily as possible. It's a continuous journey."

Sometimes it falls on a third-party vendor to facilitate communications around sustainability. HKS is a global architecture and interior design firm that works on hospitals, sports venues and senior living facilities. "The organizational structures are not always aligned around sustainability in our client organizations," says Rand Ekman, the company's CSO. To remedy that, HKS brings together the capital projects and sustainability teams to collaborate on designs and development so that sustainability is embedded in projects from the start.

CEOs Ask: What are the best strategies for aligning disparate departments behind sustainability goals?

- Involve multiple, high-level stakeholders in the decision-making about sustainability. High-visibility and high-investment sustainability projects, especially those related to technology, call for "a trio of top executives — the CFO, CSO and CIO," says Accenture's Guimbellot.

- Keep the sustainability projects top-of-mind by creating cross-functional ESG groups and holding regular meetings to keep everybody appraised of their responsibilities and progress. A study by Deloitte[1] found that 98 percent of companies they surveyed have ESG groups that meet at least quarterly to discuss sustainability, and 43 percent have such meetings once a month.

- Include sustainability as part of the performance incentives for executives outside of the sustainability functions, in areas such as operations, technology or finance. A study by Harvard Law School Forum on Corporate Governance found that in 2023, 73 percent of S&P 500 companies linked a [portion of incentive compensation to the achievement of ESG metrics](#)[4].

How Frequently Do Cross-Functional ESG Groups Meet?

2%	55%	39%	4%

■ Semi-annually or less   ■ Quarterly   ■ Monthly   ■ More than once per month

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[4] *Incentives Linked to ESG Metrics Among S&P 500 Companies,* Harvard Law School Forum on Corporate Governance, July 2023.

Building a Strong Sustainability Operating System as Your Foundation

Data is a basic building block of any sustainable business strategy. Yet collecting that data, ensuring it's accurate and transparent, analyzing it and turning it into actionable insights is a challenge. That's because, "from the point of view of data management, sustainability functions today operate like scrappy startups, where data is in spreadsheets," said Ankit Mehta, managing director of the Center for Advanced AI at Accenture. A recent study found that while more than 80 percent of organizations believe they are ahead of peers regarding ESG reporting, almost half still use spreadsheets[5].

Transparency in ESG Reporting Compared to Industry Peers
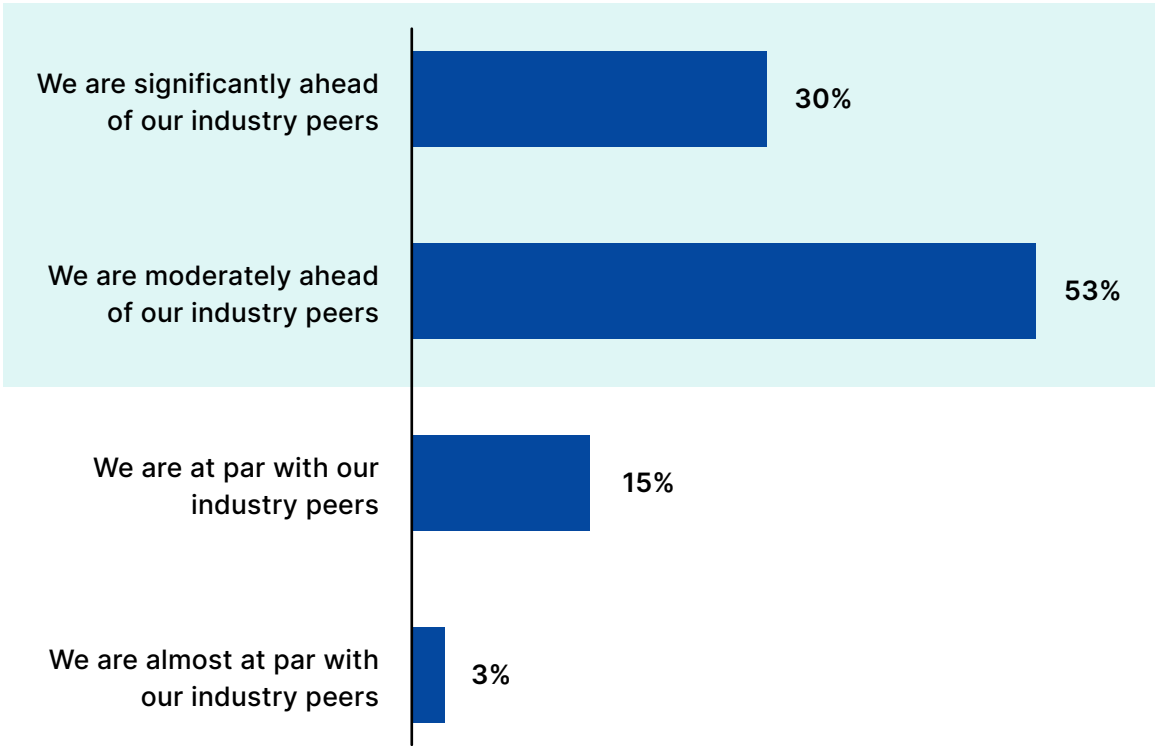
Many other respondents to the same survey were taking steps to improve matters, such as using advanced data systems for efficient and accurate ESG reporting. Yet many CSOs told Trellis they haven't found a one-stop-shop technology solution

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[5] *Addressing the Strategy Execution Gap in Sustainability Reporting,* KPMG, February 2024.

that can collect and analyze all the relevant sustainability data. Some data handling still requires manual intervention; in other cases, the information is buried in emails or sitting in silos whose owners consider it proprietary. To make matters worse, companies typically use multiple systems from different technology vendors to handle sustainability data, which makes it hard to navigate and integrate.

An ideal technology for collecting sustainability data and transforming it into actionable insights would be a real-time, centralized data platform that could serve as a single source of truth. Seamlessly integrated across all business processes, it would monitor processes and track our performance across environmental, social, regulatory and economic metrics. This platform would meet all reporting requirements in a user-friendly intuitive manner, ensuring that sustainability efforts are transparent and easily trackable.

Tania Rabasa Kovacs
Vice President of Sustainability and Corporate Affairs, Orbia

At Graphic Packaging International, for example, Chief Sustainability Officer Michelle Fitzpatrick faced multiple data management systems resulting from the company's acquisition-driven growth over the last decade or so. "In the early years of my journey at Graphic Packaging, I was manually aggregating most of the sustainability information for our operating locations," she remembers. Over the last two years, the company has transitioned to a single environmental data system that is traceable and auditable.

The picture is further complicated by new reporting regulations, including the European Union's Corporate Sustainability Reporting Directive (CSRD), the United States Security & Exchange Commission's Climate-Related Disclosures (CRDs) and requirements developed by the International Sustainability Standards Board (ISSB). Companies often need to use different tools to gather different data depending on the participant's location, role in the value chain — such as a supplier or customer — or the type of information or report that needs to be prepared.

"We have begun aligning with the new CSRD regulations, which has required us to explore new tools to ensure full compliance," said Tania Rabasa Kovacs, vice president of sustainability and corporate affairs at Orbia, a provider of sustainable products for the agriculture, infrastructure, chemical and communications sectors. Rabasa Kovacs also noted that the company must use a distinct set of tools specifically for reporting to ratings agencies.

"We're seeing a lot of different technology players coming into the sustainability marketplace, but some are so focused on what their tool can do they lose sight of what we're trying to achieve," added Comerica SVP and director of corporate sustainability Scott Beckerman. "I'm always looking for the tools that deliver actionable insights to move our organization forward on sustainability."

What Beckerman is looking for is a system that's easy to set up and can be fully integrated with other systems. The data journey from the utility bill onwards reveals the gaps, Beckerman explained. Ideally, the bill would generate insights about the goods and services the company is procuring by linking to systems for purchasing, emissions accounting, reporting and finance. At the end of that journey, the company would get estimates of the emissions associated with repeatable energy transactions. "To get to that point today, we still have to rely on a lot of manual data processing and calculation," Beckerman said.

Schneider Electric's Miler-Fels underscores the challenges of implementing data systems when she says: "Carbon and overall environmental sustainability data is your foundation while you're building the house. You're improving your foundation — granularity, availability quality — as the construction of the house is in progress. You have to do both at the same time to move ahead."

CEOs Ask: What's the best way to achieve interoperability of the data we are collecting? How do we best aggregate, normalize and traverse data in a way that allows you to get insight?

- **Adopt an ERP-centric approach.** Bring the sustainability data into the existing data models in an ERP system. For it to stay relevant, sustainability must be embedded in end-to-end transactional business processes. SAP's Sustainability Footprint Management solution pulls data from other internal and external systems, effectively allowing different solutions to speak a common language. The SAP Sustainability Control Tower then maps the data onto the required reporting scheme. "It's only when we have the

ERP-centric approach that we are capable of making not only financially driven but also sustainability driven decisions," SAP's Boos said.

- **Integrate sustainability data.** When you obtain sustainability data, do not keep it in a silo but link it to other operational processes, advised Accenture's Guimbellot. Work in real time. For example, if you are working with a supplier, input the sustainability procurement information at the time of the supplier selection or transaction. In this way real-time data will become embedded within your full end-to-end process from design and procurement through manufacturing, distribution and sales.

- **Democratize sustainability information.** "When you centralize sustainability data and information, you can also build additional use cases and capability on top of that data," Accenture's Mehta said. This journey pays long-term dividends: by democratizing access to data across the enterprise, you will reap multiple business benefits, such as creating more sustainable product designs or selecting more sustainable materials. And until you have that core, centralized foundation, you will not be able to advance the sophistication of the ESG function.

Customer Story
Green Steel

One of Europe's largest steel manufacturers, [Salzgitter AG](#) exports a range of rolled steel and tubing products to customers around the globe. Currently responsible for around 1 percent of Germany's total CO_2 emissions, Salzgitter has set itself the target of reducing this amount by 95 percent by 2033. The company realized that having the right technology in place would be crucial to meeting its sustainability goals, and it implemented SAP solutions to standardize and streamline its processes.

The initial phase involved the migration of multiple stand-alone ERP systems run by more than 150 subsidiaries to five instances of SAP S/4HANA. Thanks to that technology, Salzgitter has been able to optimize and streamline business processes across the group. The company has replaced inefficient and error-prone manual workflows with automated and digitized operations, saving time and resources.

Section 3

Refining Scope 3 Emissions Reporting

According to CDP, the nonprofit reporting body, companies' 2023 Scope 3 supply chain emissions were, on average, 26 times greater than their emissions from direct operations[6]. Yet while a Deloitte survey found[1] that around three-quarters of respondents currently report Scope 1, and just over half report Scope 2, just 15 percent prepare and disclose Scope 3 data.

For most companies, Scope 3 emissions remain stubbornly hard to track, with many companies relying on models and averages based on emissions categories and spend to calculate footprints. While the final SEC climate disclosure rule does not specifically require Scope 3 reporting, CSRD, the California climate legislation and IFRS S2 do.

Many CSOs we spoke with are responsible for their own organizations' footprints and are also monitoring and reporting on, or helping with, the footprints of clients, vendors or partners. In many cases, the footprint of the core organization is relatively simple and small compared to its clients'. Forming partnerships across these relationships can be a powerful approach to accurately tracking — and then reducing — Scope 3 emissions.

At Norfolk Southern, Chief Sustainability Officer Joshua Raglin embraces this approach by positioning his railway as a sustainable supply chain solution for clients. Raglin noted that 90 percent of Norfolk Southern's 50 biggest intermodal shippers have publicly committed to science-based climate targets. To achieve these targets, companies use rail transportation, which can reduce emissions by an average of 75 percent relative to trucking.

Historically, the rail industry has given customers system-wide averages, Raglin said. But these can vary wildly depending on the commodity being shipped. Norfolk Southern is now tracking emissions at the shipment level, capturing the whole life cycle of the emissions from every one of its 7 million annual shipments. By recording the fuel burn from every locomotive up to every 15 minutes and scaling by shipment weight, the company can provide customers with primary Scope 3 emissions data.

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6 *Scope 3 Upstream: Big Challenges, Simple Remedies,* CDP & BCG, June 2024.

At CBRE, the world's largest commercial real estate services and investment firm, sustainability leaders also see Scope 3 as an important way to add value to partners. Managing the footprint of the company's hundreds of offices, spread across more than 100 countries, pales in comparison to the challenge of tracking Scope 3 emissions from the 7 billion square feet of property and almost 50,000 buildings CBRE manages globally. While the company has reduced its operational carbon emissions by 24 percent since 2019, it has also identified $124 million in savings for clients from energy efficiency and decarbonization projects.

With Scope 3 emissions, we don't always have primary data from suppliers, but we use an AI tool to extrapolate carbon footprint. For example, when we want to know how far our toothpaste travels from a warehouse to a store, we may get an estimate of an average distance that it would have to travel to get to you. Looking ahead, it would be great to one day have a one-stop-shop system with primary data that goes beyond the company walls.

Ann Tracy
Chief Sustainability Officer, Colgate Palmolive

To do so, CBRE created a data lake that pulls information from building management systems, sensor networks and carbon accounting software. "In this way we have the data-driven insights to help clients who are buying, managing or occupying properties all over the world with resource optimization and accelerating decarbonization," CBRE's Bernard said.

These initiatives point to a future in which our understanding of Scope 3 emissions catches up, and is integrated with, that of Scopes 1 and 2. At Comerica, for instance, the company has long reported data on its Scope 1 and 2 emissions, but recognizes the higher level of uncertainty in some Scope 3 emissions. The company is actively looking at how to integrate Scope 3 emissions within its systems, because "the distinction between our footprint and their footprint just gets blurrier as time goes on," Beckerman said.

CEOs Ask: How can technology help with access to and accuracy of Scope 3 data?

- **Gather primary data from suppliers.** Ask for Scope 3 information at the beginning of each transaction and store it in the ERP. It falls upon larger companies to also potentially help smaller suppliers by educating them on how to calculate footprint. SAP's Boos noted that it is a common practice among the original equipment manufacturers (OEMs) in the automotive industry, for example, to ask suppliers for footprint data.

- **Sustainability footprint management** solutions provide a capability to calculate the footprint of a product — a toothbrush, for example — by prompting suppliers along the chain to provide their footprint for the components. It also gives companies the opportunity to exchange data with suppliers and customers, and to integrate footprint results into key business processes to drive sustainable decision-making based on end-to-end carbon management.

- **Emission factor management.** When there is no primary data available, companies can use the so-called emission factor mapping that is embedded in SAP Sustainability Footprint Management. Powered by AI, this solution connects to life-cycle assessment databases that can provide averages. The mapping of emission factors to ERP data minimizes manual effort and enhances the accuracy of results.

- **SAP Sustainability Data Exchange** is a technology that allows companies to share footprint calculations in a secure way with suppliers and customers, ideally based on primary data. Using an interoperable, cloud-based, industry-agnostic solution can help companies drive scalability, standardization and trust in carbon data exchange across supply chains.

Section 4

Accelerating Sustainability Function Maturity with AI

Sustainability executives are on board with artificial intelligence. More than half say improving data analysis and consolidation using AI are top actions they will be taking over the next three years to enhance ESG capabilities[5].

One issue that needs to be addressed is the high energy intensity of AI. The boom in generative AI means that by the end of the decade, AI data centers could consume as much as a quarter of all American electricity. The good news is that companies running data centers are aware of the need for sustainability and are taking steps to reduce emissions. HKS works on buildings that house machines performing high-volume computations and devour enormous amounts of energy in the process.

Artificial intelligence significantly shortens the maturity journey for the sustainability function. The benefits go well beyond timing and include lowering the costs of the production of ESG reports, lowering or eliminating the cost of noncompliance and improving the quality of data. The total cost reduction related to sustainability reporting could be up to 40 percent.

Stephanie Guimbellot
Global Lead SAP Sustainability and Innovation, Accenture

"These technology clients are typically very sophisticated around the topic of emission reduction," says HKS's Ekman. "They are interested in working with an architectural firm that can give them data and feedback on their designs from the perspective of sustainability. This helps them make better decisions and allows them to develop their annual reporting on emissions."

A study by White & Case states that "in the drive toward greener data centers, two key strategies emerge: the use of renewable power and the reduction of power usage through more efficient technology." As an example, notes the study, there has been a notable rise of co-location of data centers with renewable energy-generating assets. Also, energy storage options are being used more frequently to reduce the risk of outages while avoiding the need to draw energy from the grid at peak times[7].

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[7] "Data Centers: Can the Demands for Increased Capacity and Energy be Met Sustainably?" White & Case, April 2024

Despite the increased energy use, the energy savings that AI-powered analyses will identify should ensure the technology has a net positive impact on the climate and environment. "The first step is to make sure that we are applying the minimum compute necessary to get a desired outcome," said SAP Global Head of Artificial Intelligence Walter Sun. He adds that AI models can be built to be cognizant of the risks of too heavy a compute load and limit their energy usage.

CEOs Ask: What are the key benefits AI brings to sustainability reporting and emissions reductions?

- **Carbon footprints that are easier and quicker to calculate.** AI can combine sustainability data with ERP data to automate sustainability tasks and make them auditable. This technology is embedded into SAP Sustainability Footprint Management, one of SAP's sustainability solutions, which calculates carbon footprints for what may be millions of products throughout their whole life cycles. AI-enabled emission factor mapping within SAP Sustainability Footprint Management automates the tedious process of mapping emission factors of products and components to lifecycle assessment data, reducing manual effort and time required, resulting in more precise emission estimates and faster decision-making.

- **Company-wide visibility into sustainability metrics.** SAP Sustainability Control Tower is a central application that unites data sources from various business areas, providing easy access to key sustainability information. Embedded into it is the AI-enabled capability to generate ESG reports, streamlining the reporting process and providing a clear picture of a company's sustainability performance. A generative AI co-pilot, Joule, also lives across SAP applications. Business users can ask Joule questions using natural language or give it commands. The ease of using Joule democratizes access to data, allowing people from multiple functions to create new use cases that drive sustainability.

- **Tools that drive down energy consumption and water usage.** AI-driven real-time data collection and analysis allows for energy optimization solutions from smart grids, predictive maintenance and smart buildings. In the most basic example, AI-driven motion sensors turn off lights when there is nobody around. An experimental study of AI-driven applications targeting energy savings estimated that such solutions can lead to 35 percent energy cost saving in a building; up to 70 percent reduction of information transfer

and communication power; a continuous output of 30 percent peak power from a renewable energy device to the microgrid; and 20 percent power demand reduction in the factory[8].

Orbia's Story

A Blue-green Roof

Orbia's AI-driven blue-green roofs provide an example of how AI can help uncover energy savings. The company's intelligent water storage feature sits under a vegetation-covered roof equipped with sensors that monitor environmental conditions and integrate local weather forecasts. The roofs capture rainwater and release it through evaporation to cool the roof or water plants. Additionally, the roofs intelligently manage water levels, creating extra capacity ahead of heavy rainfall to prevent sewer overflows.

"Green roofs began gaining traction as a way for cities to mitigate the effects of climate change," Orbia's Rabasa Kovacs said. "Now blue-green roofs with integrated smart control systems are the next evolution of the technology, getting us one step closer to smart cities and net-zero water usage."

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[8] *Universal workflow of artificial intelligence for energy saving*, Energy Reports,
Vol. 8, November 2022, pg 1602-1633

Conclusion

Different Industries, Different Challenges, Shared Solutions

The senior sustainability leaders who spoke with Trellis for this report work in industries that seem very different, from consumer packaged goods and investment to buildings and banking. They would also seem to face very different sustainability challenges. Yet the conversations revealed a common set of guiding principles that can grow value and boost sustainability across diverse business sectors.

As is often the case with the biggest challenges, a clear strategy with buy-in from the board and C-suite is an essential starting point. With the right top-down leadership, the outdated idea that sustainability challenges are only for sustainability teams can be jettisoned. In its place come strategies that go beyond compliance to focus on the opportunities that sustainability brings across multiple lines of business and value chains.

It's not enough to have a sustainable strategy, aimed at compliance. What's needed is a sustainable business strategy, aimed at making sustainability a competitive advantage.

Christian Boos
Head of Sustainability Innovation, SAP

Technology is key to realizing those opportunities, added the leaders Trellis spoke with. Spreadsheets of sustainability data are another idea whose time is past. A new generation of ERP-centric, AI-enabled tools is rendering the old approach obsolete and creating a centralized system with transformative benefits, including automated reporting to multiple standards and more efficient data exchange along the value chain.

These benefits will then drive progress on key issues that motivated company leaders to invest in the technology: reducing environmental harms while simultaneously growing the business. This journey — from having a sustainability strategy to reaping the strategic advantages of sustainability — is a complex one. But as the interviews with leaders revealed, it's happening now as companies across industries implement the technology that makes it possible. With the right technology from the right partner, your company can follow in their footsteps.

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