



EBOOK

ESG: AWS Sustainability Solutions for Retail and CPG

How retailers and CPG companies leverage technology to achieve sustainability goals, boost customer satisfaction, and drive bottom-line benefit





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83%

of consumers say businesses should be actively shaping best practices around environmental, social, and governance (ESG) issues

60%

say sustainability is an important factor in their purchase decisions

34%

are willing to pay over 2x more for sustainable products/services



Retail and CPG sustainability in the cloud

What's good for people and the planet is good for business

Operating sustainably is no longer a choice—it's an imperative. Making meaningful progress to address climate change takes unprecedented action across all industries and societies. Consumers want to buy from, employees want to work for, and investors want to invest in retailers and CPG companies actively addressing critical environmental and social issues:

- Reducing carbon footprint and protecting environmental resources
- Sourcing eco-friendly materials and the circular economy
- Optimizing and reducing packaging
- Working with socially responsible vendors
- Promoting inclusion, diversity, and equity
- Protecting consumer data privacy and security

What is ESG?

ESG stands for Environmental, Social, and Governance:

- **Environmental:** Conservation and protection of the natural environment
- **Social:** Relationships with employees, suppliers, clients, and communities
- **Governance:** Standards for company leadership, risk controls, and shareholder rights



Opportunities for forward-thinking retailers



Reducing carbon footprint and protecting environmental resources

- Understand your company's baseline environmental impact across the entire value chain and identify key areas for improvement
- Reduce energy and water use, such as using smart controls and sensors for in-store lighting and temperature control or recycled water for fabric dyeing
- Shift to renewable resources and eco-friendly materials, such as opting for electric delivery vans, solar panels on store roofs, or hydrogen forklifts in warehouses
- Decrease waste and pollution through actions, such as correctly forecasting inventory to reduce markdowns or improving cold chain efficiency to decrease food waste
- Address chemical and hazardous materials safety, such as eliminating potentially harmful chemicals from products



Sourcing eco-friendly materials and the circular economy

- Make intentional and informed sourcing choices starting with product design
- Design for the circular economy—design out waste and pollution, build products that are meant to last or optimized for recycling
- Promote animal welfare, such as only offering products that are cruelty-free or animal byproducts of the food industry



Optimizing and reducing packaging

- Balance the need to reduce packaging materials while avoiding product damage and waste
- Choose the most eco-friendly packaging materials based on channel, market segment, and location



Working with socially responsible vendors

- Audit suppliers to eliminate human rights violations in labor practices
- Promote a living wage for suppliers and employees
- Address stakeholder health and safety issues, such as safety training, employee wellness benefits, and ensuring surrounding communities are positively impacted by company operations



Promoting inclusion, diversity, and equity

- Promote diversity in advertising, marketing, and hiring
- Cater to different shoppers' product needs and preferences
- Ensure a positive and non-discriminatory shopping experience for all customers



Protecting consumer data privacy and security

- Protect customer and employee privacy
- Secure sensitive data and protect against cyberattacks

Meet retail and CPG sustainability goals with leading-edge technology

While all ESG practices are important in building a competitive advantage, many retailers and CPG companies choose to start with those focused on the environment. In part, that's because the technologies needed to measure, manage, and report on sustainability efforts are more mature than those focused on social issues, although that will continue to evolve.



Here are five ways technology and data are driving the future of sustainability in retail and CPG:

1 Calculate carbon footprint

The first step for retailers and CPG companies committed to a net-zero emissions target is to calculate their current carbon footprint. Once they create a baseline, they can take action. The challenge is that creating and selling a product is a long, complicated chain of transactions, and each link contributes to greenhouse gas emissions. Technology, like automated data measurement and management and IoT services, helps by connecting different systems and data from each player in the supply chain. By collecting, aggregating, and storing data points in one place, retailers and CPG companies can make decisions with transparency across the value chain.

2 Provide visibility down to the product level

Once a retailer or CPG company has gathered data at a company level with a carbon footprint calculator, it's ready to trace data points down to the product level. Companies can add a QR code or website link to their product or product packaging with information about a product's carbon footprint, water usage, and more. These metrics could then be shared with consumers to educate them on the process and increase demand for sustainably produced and supplied products.

Greenwashing—providing misleading information about the environmental benefit of products—is a growing threat to consumer trust and company reputation. For forward-thinking retailers and CPG companies, providing transparency at the product level could be a revolutionary way to reestablish that trust. This level of transparency could lead to a consumer ESG score that would help consumers evaluate the social and environmental impact of the products they buy.



3 Score products on ESG metrics during product design or product selection

Once data can be traced down to the product level, this information can be considered from the very start, either during product design or assortment. For example, retailers and CPG companies could use AI to forecast an ESG scorecard through a computer-aided design program. For private brands, as a designer creates a product in the program, the program could generate a scorecard of ESG metrics. The scorecard metrics could reflect any number of variables depending on the data collected, such as materials, suppliers, packaging, or distances traveled. For products purchased from manufacturers, retailers and CPG companies can invest in or incentivize this type of data tracking to make more informed buying decisions. With this approach, the circular economy can be top of mind from the start.

4 Produce the right amount and minimize returns

Once a product has been digitally designed, retailers and CPG companies could test its commercial viability by making it available for preorder before full-scale manufacturing begins. Augmented reality (AR) provides consumers with a virtual try-before-you-buy experience. If, as part of that experience, consumers see the ESG scores for a product, they can make more informed decisions, vote, or provide feedback before the product leaves the virtual design phase. With these preorder demand signals, a retailer or CPG company can use forecasting tools to estimate inventory needs more accurately, which reduces the inherent waste of markdowns, or even make product adjustments to reduce unsellable “flops.” 3D printing can expedite lead times, so consumers don’t have to wait months for their order.

5 Data exchange collaboration initiatives

In the spirit of “A rising tide lifts all boats,” retailers and CPG companies that gather ESG data can make the biggest impact by sharing it. Consumers shop for different brands at the same retailers; retailers often use the same suppliers; suppliers often source materials from the same places. Offering noncompetitive data points through a data-sharing initiative will help companies across the supply chain get on board with a universal standard of ESG metrics. Sharing data can also lift the burden of supplier “audit fatigue,” which can result from an abundance of ESG data requests. For example, [Open Supply Hub](#), [Fair Factories Clearinghouse](#), and [Higg](#) are a few companies that are driving data sharing and collaboration in the industry.

AWS helps retailers and CPG companies reach sustainability goals

Innovation is key to achieving sustainability goals—challenges such as decarbonization of operations and improving demand planning accuracy are addressed through technologies that drive sustainable transformation. AWS enables customers to build sustainability solutions ranging from carbon tracking to energy conservation to waste reduction using AWS services to ingest, analyze, and manage sustainability data. AWS offers the broadest and deepest set of capabilities in artificial intelligence (AI), machine learning (ML), Internet of Things (IoT), data analytics, and computing to help retailers and CPG companies reach their sustainability goals. AWS thinks about sustainability as an evolutionary process of migrate, optimize, and transform.

Migrate



Moving to AWS can help lower customers' workload carbon footprint

Transitioning to renewable energy is one of the highest-impact ways to immediately lower emissions. Studies by 451 Research, part of S&P Global Market Intelligence, have shown that AWS' infrastructure is more efficient than on-premises data centers. AWS is 3.6 times more energy efficient than the median of U.S. enterprise data centers surveyed and up to five times more energy efficient than the average in Europe. A similar study of organizations in Japan, South Korea, Singapore, Australia, and India found that, on average, moving to the cloud was up to five times more energy efficient than using their on-premises data centers. After analyzing several regions, 451 Research also found that AWS can lower customers' workload carbon footprints by nearly 80% compared to surveyed enterprise data centers and up to 96% once AWS is powered with 100% renewable energy—a target AWS is on track to meet by 2025.

Optimize



AWS Well-Architected Framework sustainability pillar

The sustainability pillar of the AWS Well-Architected Framework helps organizations learn, measure, and improve their workloads using environmental best practices for cloud computing. It is designed to support organizations in developing a better understanding of the state of their workloads, as well as the impact related to defined sustainability targets, how to measure against these targets, and how to model where they cannot directly measure. Working with AWS, Starbucks saw that from 2019 to 2020, the actual carbon footprint of its AWS workloads was reduced by approximately 32%, despite tremendous business growth during that same period. The customer carbon footprint tool indicates that these systems' carbon footprint was further reduced by 50% in subsequent quarters.



Optimize



Making the grid greener through renewable energy optimization

Amazon collaborates with renewable energy providers across the world to bring online new renewable projects dedicated to serving its power needs, which are monitored by [Amazon's renewable energy optimization \(REO\) team](#). The REO team is also responsible for maximizing operational and financial performance of assets. These optimizations help Amazon achieve its sustainability goals at scale across its global footprint. The REO team developed an end-to-end solution using AWS services to perform near real-time monitoring of its renewable energy projects. The team used AWS IoT-based architecture to create a highly secure, reliable, scalable, and low-cost solution that manages data from hundreds of these projects.



AWS Carbon Footprint tool

As AWS continues to invest in sustainability across its infrastructure, its new customer carbon footprint tool uses simple visualizations to show customers their historical carbon emissions, evaluate related trends as their use of AWS evolves, estimate emissions avoided by using AWS instead of an on-premises data center, and review forecasted emissions based on their current usage. Historical carbon emissions data is available based on a customer's AWS use from January 2020 onward. This data includes Scope 1 and Scope 2 emissions. Scope 1 emissions come directly from a company's operations, while Scope 2 emissions come from the generation of purchased energy, such as the electricity used to power Amazon facilities. The customer carbon footprint tool uses carbon data that meets the widely adopted international standard of the Greenhouse Gas Protocol, which supplies the world's most widely used greenhouse gas accounting standards.



Transform



Sustainable cold chain

For retailers that rely on cold chain technology, [AWS can help minimize end-to-end resource consumption](#) by leveraging data collected from IoT sensors and applying AI/ML tools to ensure product transport/storage operates at optimum temperatures to reduce product waste.



Sustainable packaging

Packaging plays a critical role in the customer delivery experience. [AWS AI/ML solutions](#) can help retailers optimize packaging operations to reduce waste and discover alternatives, such as more recyclable options. [Amazon, in part by using AI/ML](#), has reduced the weight of outbound packaging by 38% and eliminated over 1.5 million tons of packaging.

Transform



Constructing more sustainable buildings

By combining data collected from IoT sensors and building management systems with AWS AI and ML tools, retailers can ensure buildings are operating at maximum efficiency to reduce carbon footprint and material consumption. In one case, [AWS digital twin technology](#) enabled a 50% reduction in energy costs and a 20% reduction in maintenance costs. Additionally, AWS data centers are being constructed with steel made from electric-arc furnaces, which use scrap steel and can create steel using renewable energy and up to 100% recycled content, instead of oxygen furnaces that burn coal or gas. Six of these data centers have been built and more are planned. Further, in early 2022, the Amazon Fresh location in Seattle, Washington, became the world's first grocery store to pursue Zero Carbon Certification from the International Living Future Institute, a leading nonprofit dedicated to advancing sustainable building practices.



Supply chain optimization

AWS [intelligent supply chain solutions](#) like Supply Chain Control Tower improve retail supply chain efficiency and resiliency using purpose-built analytics, ML, and automation. By integrating store data with an eCommerce platform, AWS turns stores into micro-fulfilment centers, with nearby deliveries coming from local stores instead of from far-away centralized fulfilment centers. Supply chain automation can boost overall productivity and add more efficient use of stock.



Energy efficiency

AWS uses innovation to improve power efficiency in multiple ways, including its investment in AWS-designed chips and the AWS Nitro System. For instance, AWS-designed Graviton3 is AWS' most power-efficient general-purpose processor. Graviton3-based Elastic Compute Cloud (EC2) instances [use up to 60% less energy](#) for the same performance than non-Graviton EC2 instances. With the world's increasing need for computing, and as machine learning has become mainstream, continually innovating at the chip level will be critical to sustainably powering the workloads of the future.



Demand forecasting

[Amazon Forecast](#), a time-series forecasting service based on ML and built for business metrics analysis, can help retailers forecast demand to optimize inventory and reduce waste. [More Retail Ltd.](#) (MRL), one of India's top four grocery retailers, used Amazon Forecast to increase its forecasting accuracy from 24% to 76%, leading to a reduction in wastage of up to 30% in the fresh produce category, improving in-stock rates from 80% to 90%, and increasing gross profit by 25%.



Sustainability solutions for retail and CPG in action

Discover how AWS and AWS Partners are delivering results for retailers and CPG companies with sustainability solutions powered by AWS

Gousto drives real corporate impact in carbon reduction using Altruistiq's sustainability management software on AWS

Gousto, a leading UK recipe box provider delivering eight million meals per month, was founded in 2012 with the idea of reducing food waste. While over time the company has expanded its definition of sustainability to include areas such as packaging, carbon emissions, and healthy outcomes, it struggled to collect and manage the data needed to measure its impact and identify strategic opportunities for change.

To automate the data measurement, management, and exchange process, Gousto turned to AWS Partner Altruistiq, a software solution that drives real corporate impact in carbon reduction and beyond. Now Gousto can calculate and mitigate its impact across the entire business, from suppliers to employees to customers, and plan for future efforts. To date, Gousto has cut plastic packaging in its boxes by 50% and maintained food waste levels below 1% in its facilities.

[Read the story >](#)

[Connect with Altruistiq to learn more >](#)

“

Food production and distribution are responsible for a lot of negative environmental impacts, but they can also be responsible for future solutions. Sustainability should be central to any forward-thinking business.”

Hugh Lewis

Head of Sustainability, Gousto





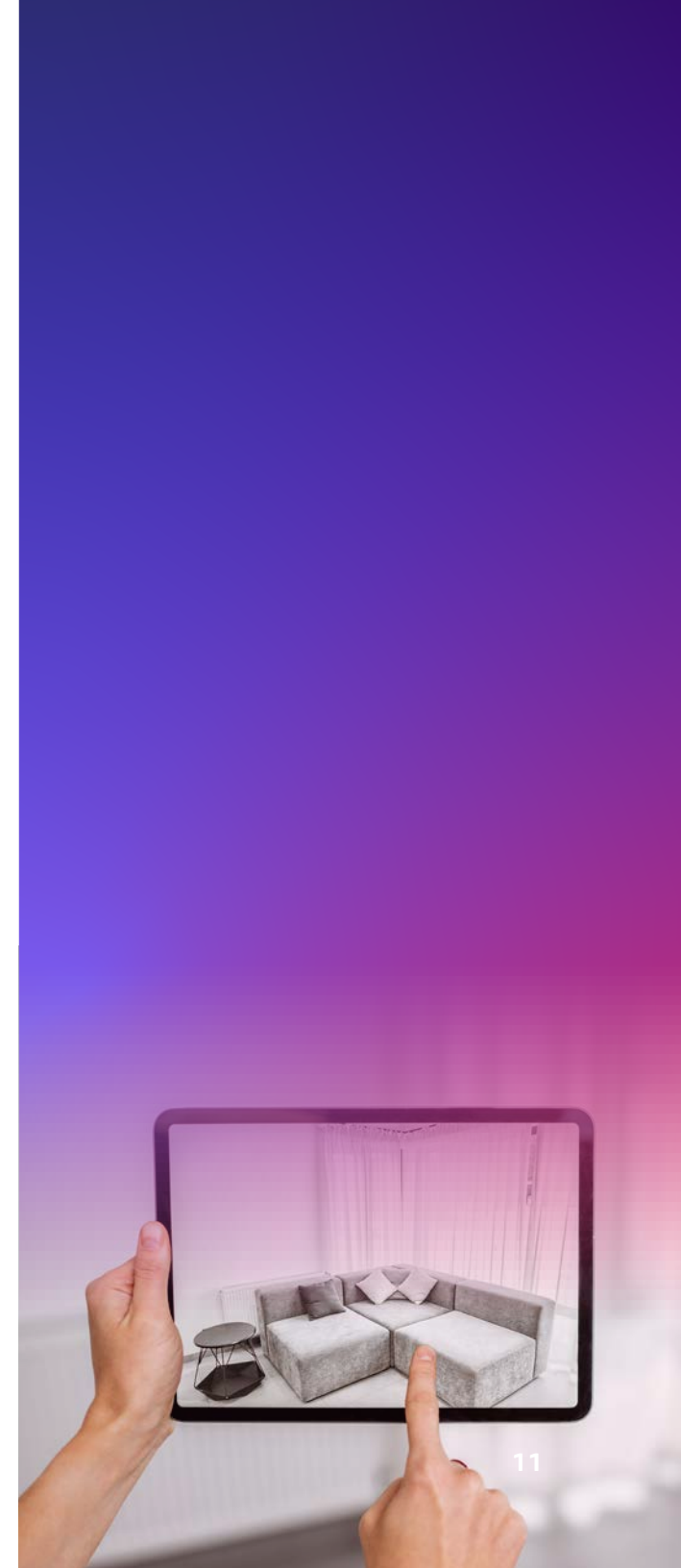
Hexa offers a powerful immersive OS for brands to elevate consumer experiences at scale

In retail and CPG, the production of visual assets is a notable contributor to emissions. Many companies are turning to immersive technologies, such as virtual try-on, to reduce carbon emissions and elevate the customer experience.

Hexa is a 3D commerce and augmented reality (AR) solution powered by AWS. The company offers retailers and CPG customers 3D asset pipelines and AR features that provide consumers with virtual and immersive try-before-you-buy interactions. These interactions enhance the online shopping experience and help brands achieve their sustainability goals by reducing returns and cutting the unnecessary impact of physical product marketing. Hexa's sustainability-first approach helps retailers increase market share and sales, lower consumer acquisition costs, and reduce returns while simultaneously decreasing the environmental impact of online consumer purchases.

[Read the story >](#)

[Connect with Hexa to learn more >](#)





Britvic launches sustainable digital flavor tap to eliminate single-use plastic bottles

The single-use plastic beverage bottle, long a detriment to the environment, has hung on due to its convenience. Britvic, an international soft drinks company, wants to help put an end to that as part of its Healthy People, Healthy Planet mission.

Working with AWS, Britvic has created an innovative digital flavor tap targeted at offices and retail environments. The tap reduces plastic bottle use by dispensing zero-calorie flavored water into reusable containers, providing a more sustainable and healthy way to enjoy beverages. Britvic sees this as an opportunity to eliminate single-use plastic beverage containers and provide a way for consumers to drink fewer sugary drinks, thus making a positive impact on both the environment and personal health.

[Read the story >](#)

[Connect with Green Custard to learn more >](#)

“

With Aqua Libra, we're offering a new proposition for customers to reduce their carbon footprint, while providing healthy hydration options for staff and shoppers.”

Scott MacKenzie

Beyond The Bottle Proposition Lead, Britvic





The Modern Milkman uses AI-driven supply chain to reinvent doorstep delivery and cut plastic waste

The Modern Milkman is a UK-based community- and sustainability-focused retailer working with independent farmers and suppliers to deliver fresh milk, eggs, fruit, vegetables, baked goods, and other groceries in sustainable packaging.

By leveraging AWS cloud technology and AI-driven supply chain forecasting from AWS Partner Peak, the company is optimizing delivery and availability while being sustainable and ethical. The Modern Milkman utilizes Peak's platform to combine and analyze shelf-life information, customer orders, and supply and warehouse data, thereby instantly making predictions that ensure customers receive complete orders without substitutions.

[Read the story ›](#)

[Connect with Peak to learn more ›](#)

“

With a better overview of our supply chain, we can prevent waste not only at an operational level, but also in the customer's daily life.”

Simon Mellin

Founder and CEO, The Modern Milkman



ESG glossary

While there are dozens of terms that could be included in an ESG glossary, here are a few that are particularly applicable to retailers and CPG companies:

Carbon footprint

A carbon footprint measures the total greenhouse gas (GHG) emissions caused by the direct and indirect activities supporting a company. These emissions are broken into three categories—Scope 1, 2, and 3 emissions. Scope 1 emissions come directly from a company's operations. Scope 2 emissions come from the generation of purchased energy. Scope 3 emissions include all other activities that take place beyond a company's direct operations.¹

The circular economy

The circular economy model is regenerative by design and aims to improve resource performance. In fact, a circular economy is based on the idea that there is no such thing as waste. To achieve this, products are designed to last and optimized for a cycle of disassembly and reuse that will make it easier to handle and transform or renew them. The circular economy is a systems solution framework that tackles global challenges like climate change, biodiversity loss, waste, and pollution. It is based on three principles, driven by design: eliminate waste and pollution, circulate products and materials (at their highest value), and regenerate nature.²

Climate change

Human activities such as burning fossil fuels, clearing forests, and cultivating lands for agricultural use contribute to climate change by emitting carbon dioxide (CO₂) and other greenhouse gases (GHGs) that trap heat in the atmosphere. Effects include rising average temperatures and stronger and more frequent storms, drought, and wildfires.³

Greenhouse gas (GHG)

Any of the various gaseous compounds (such as carbon dioxide or methane) that absorb infrared radiation, trap heat in the atmosphere, and contribute to the greenhouse effect.⁴

Greenwashing

When organizations use marketing or PR to deceptively imply that their products, services, or practices are more environmentally friendly than they actually are.⁵

Recommerce

Recommerce or reverse commerce is the selling of previously owned, new, or used products, mainly electronic devices or media such as books, through physical or online distribution channels to buyers who repair, if necessary, then reuse, recycle, or resell them.⁶ Recommerce includes resale, rental, and subscription models.⁷

Sustainability

A practice that focuses on meeting the needs of the present without compromising the ability of future generations to meet their needs.⁸

Total carbon emissions (TCE)

Total greenhouse gases released into the atmosphere by human and operational activities. This is measured in carbon dioxide equivalents (CO₂e).⁹

Triple bottom line

"People, planet, and profit" is also known as the triple bottom line. "People" refers to fair labor practices and the community and region where the business operates. "Planet" refers to sustainable environmental practices. "Profit" is the economic value created by the organization after deducting the cost of all inputs, including the cost of the capital (unlike accounting definitions of profit).¹⁰

Your path to retail and CPG sustainability starts here

Wherever you are on your sustainability journey, AWS technologies and partners can help.

To learn more or get started ›

Find out more about what we're doing to drive sustainability across Amazon and beyond.

Download Amazon's 2021 Sustainability Report ›

