

Data: A powerful ally in tackling *Scope 3* emission reduction targets

How companies can use artificial intelligence and machine learning across the supply chain to address mandates and meet sustainability goals



The call for resilient, sustainable supply chains is louder than ever.

Climate consciousness is increasing and organizations realize the critical role they play in combating the global warming crisis. One area of growing pressure is setting Scope 3 emission reduction targets – a mandatory requirement under the [Science Based Targets initiative \(SBTi\) Net-Zero Standard](#).

Scope 3 emissions constitute 70 percent or more of the total carbon footprint for many companies. [SBTi encourages companies](#) to set ambitious goals for reducing these emissions, focusing on decarbonization methods that lead to the earliest reductions and the least cumulative emissions.

The state of California has already mandated that companies report their Scope 3 emissions by 2027, and the clock is ticking on the United States federal government to follow California's lead. But beyond compliance, tackling hidden sources of emissions can help companies build a more sustainable future and gain a competitive edge.

Simply stated, ignoring Scope 3 is not an option. And supply chains represent a significant opportunity for reduction. Emissions generated through the [transportation and distribution of products and storage of products in warehouses and retail distribution centers](#) are just some of the supply chain areas a business can target.

45%

of organizations say they use emissions data only for mandatory reporting and do not embed it in decision-making, according to [Capgemini Research Institute data](#)

Mandates are mounting for emissions tracking

The days of focusing solely on direct emissions are over. New mandates are pushing companies to account for their full impact. Scope 3 emissions can be challenging to track and manage due to the complexity and diversity of the value chain.

SCOPE 1

Covers direct emissions from owned or controlled sources, such as company vehicles.



SCOPE 2

Involves indirect impact emissions from the purchase and use of electricity, steam, heating, and cooling.



SCOPE 3

Includes all other indirect emissions from the upstream and downstream activities of an organization's value chain, including those from suppliers and customers and the use and disposal of products.





The question is, how do companies take this next step on their decarbonization and sustainability journey?

The time is now, and many companies are not ready

As the focus on Scope 3 emissions intensifies, enterprises struggle to measure and report their carbon footprint across the entire value chain.

Data access is a major roadblock. One SBTi study shows that data is a primary barrier for creating a Scope 3 baseline and demonstrating progress. The [report states](#) that, “While 83 percent of respondents have a Scope 3 baseline, 85 percent believe data access is a barrier to developing an inventory. This is primarily due to a lack of supplier data; only 6 percent of respondents use supplier-specific emissions factors today.”

Some suppliers, especially smaller organizations, do not have the capability to monitor Scope 3 reporting. Yet even for those with the capability, data is often stored in disparate ways, including PDFs, annual reports, geospatial data, along with countless other inputs.

Companies must extract data from a variety of sources and connect it to compute Scope 3 emissions. This is where technology plays an essential role.

How technology can help companies that produce goods to solve for Scope 3

Artificial intelligence (AI) and machine learning (ML) are revolutionizing Scope 3 emission tracking. These powerful tools can analyze supplier data, consumer usage patterns, and satellite imagery to provide granular carbon footprints for products and uncover hidden emissions hotspots. Companies can leverage these insights to make informed decisions on how to reduce their Scope 3 emissions.

Capgemini has identified four primary use cases for AI and ML to determine and optimize Scope 3 emissions, based on experience with clients.

1 DATA FUSION AND ANALYSIS

AI and ML can collect, analyze, and interpret vast amounts of data from various sources – suppliers, satellites, and the company itself – to provide a comprehensive representation of Scope 3 emissions. A business can use analytics to identify areas with high emissions intensity, optimize transportation routes, and explore alternative modes of transportation to reduce carbon footprint.

For example, a retail company that wants to assess Scope 3 emissions from its global transportation activities can use AI and ML to integrate data from logistics providers, fuel consumption records, and shipment volumes. Through data analysis and consolidation, the company can capture an accurate and real-time view of transportation emissions.

AI in action

[Rockwell Automation](#), provider of industrial automation and digital transformation technologies, [uses a sustainability calculator](#) to quantify waste and carbon emissions reduced by repairing automation assets rather than replacing them. The company achieved an estimated 91 percent reduction in avoided CO₂e Scope 3 emissions (vs. buying new) and avoided approximately eight percent of hazardous waste being sent to landfill.

2 PREDICTIVE MODELING

Companies can use AI and ML to evaluate the environmental impact of a product throughout its entire lifecycle. By evaluating every step – from extracting raw materials, to manufacturing processes, product usage, and end-of-life disposal – an organization can develop predictive models. Historical data, production volumes, energy use, and product lifespans inform smart models that predict how much carbon footprint each product carries.

Companies can use machine learning to track reported and predicted emissions by type, such as upstream transportation and distribution and waste generated in operations. The findings will then help identify specific opportunities for emission reductions and ways to optimize production processes and recycling programs to minimize environmental impact.

AI in action

Unilever partnered with MIT to develop an AI-powered predictive model that estimates the carbon footprint of individual palm oil shipments based on factors like the location of the plantation, processing methods, and transportation routes. Using supplier data, satellite images, and even phone data, they pinpoint where palm oil comes from, identifying any deforestation risks. The company can prioritize sourcing from greener areas and work with suppliers to reduce emissions throughout the supply chain. By the end of 2022, it sustainably sourced 94 percent of its core palm oil.

3 SUPPLY CHAIN OPTIMIZATION

Examining supplier data, transportation routes, and energy consumption patterns enables supply chain operators to identify suppliers with higher carbon footprints.

Data-driven transparency into supply chain emissions helps companies guide key partners toward greener practices like local sourcing, renewable energy adoption, and circular economy principles. The results include a smaller carbon footprint, reduced vulnerability to disruptions, and lower costs through streamlined operations.

AI in action

Nestlé's Scope 3 emissions comprise 95 percent of its carbon footprint. Long transportation distances for products across its global supply chain are a key culprit in generating Scope 3 emissions. It is using data to optimize transportation routes based on factors like fuel efficiency, traffic patterns, and real-time conditions. The company projects reducing its logistics transportation emissions from 10 million metric tonnes of CO₂e to 6.5 million tonnes by 2030.

4 DECISION SUPPORT SYSTEMS

AI-powered processes can connect information from financial systems and external sources into executive dashboards to provide insights that can help optimize operations and enhance decisions. By considering emissions, costs, and regulatory compliance, the company can prioritize initiatives that align with climate goals and support reductions in Scope 3 emissions.

Say an automotive manufacturer wants to make informed decisions about its Scope 3 emission reduction strategies. AI can help quantify the environmental impact of different decisions, like adopting electric vehicles, implementing energy-efficient processes, or using renewable materials.

AI in action

H&M plans to reduce its Scope 3 emissions by 56 percent by 2030. One of its key initiatives is a carbon pricing tool called "A" that considers the carbon footprint of materials and production processes. The tool steers buying, design, and merchandising teams toward the purchase of low-carbon materials for products and the selection of low-emission production units.

Build a more sustainable supply chain

Sustainable supply chains are a strategic imperative for companies striving to set ambitious Scope 3 targets and, more importantly, achieve them. The key to unlocking their potential lies in harnessing the power of AI and ML.

Capgemini works with clients to help them:

- **Make strategic decisions about decarbonization.** Clients model scenarios, track emissions, and prioritize projects that enable the most effective decarbonization.
- **Execute decarbonization strategies.** Capgemini helps assess, design, and implement decarbonization in operations,

define and execute transition plans, and continuously monitor and adjust to optimize carbon reduction across the value chain.

- **Industrialize carbon accounting.** Using digital platforms, Capgemini collects all relevant global data about Scopes 1, 2, and 3, performs necessary calculations to inform external disclosures and decisions, and designs processes that support transparency and auditability.
- **Build on a digital foundation.** Clients can assess existing measurement systems, identify data gaps, and establish comprehensive digital architectures for carbon tracking and management on the right digital foundation.

For more than two decades, Capgemini has prioritized sustainability and invested in innovations that help clients meet their net-zero goals. Capgemini also works with leading technology partners to help companies harness the potential of data and optimize their systems and processes sustainably.

Demystify data hurdles. Build robust measurement frameworks. Implement impactful emission reduction strategies. Take the first step toward a more sustainable future by exploring how AI and ML can empower your organization to reduce Scope 3 emissions.



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