Thought you knew the Scope 3 issues in your supply chain? Think again.

Gaining visibility to hidden hot spots to move from targets to action to value

Voices of **Change**

From insights to action, the path to extraordinary value starts here.

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Foreword

With the climate clock ticking, reducing Scope 3 emissions—those that are the result of activities from assets not owned or controlled by the reporting organization, but that the organization indirectly impacts in its value chain[1]—has become a top priority for companies around the world, especially those that have committed to net zero. It's a tremendously difficult problem to solve, given the huge, complex global supply chain networks that are the backbone of modern companies. Most large companies, for example, don't even know the suppliers beyond Tier 1, those they interact with directly—let alone have any sort of influence or control over them.

This lack of visibility means companies only know what they can see—which isn't all that much. They can't truly manage Scope 3 emissions beyond Tier 1 suppliers and report them in a consistent, repeatable and auditable way. In fact, **the vast majority of**

companies have made little progress to date in dealing with Scope 3 emissions because they just don't know where to find them.

It's vital for companies to be able to identify all the sources of their upstream emissions because, Accenture research has found, most of these emissions—nearly two-thirds—come from Tier 2 suppliers (i.e., subcontractors) and beyond.

Visibility into the supplier base is key to putting companies in the position to act:

• It helps them make better-informed decisions about how and where to allocate their resources to deliver the greatest impact. That's especially critical now, as companies need to accelerate their progress if they're to meet their ambitious decarbonization goals.

• It enables chief supply chain officers and procurement leaders to understand how to embed responsible procurement across the enterprise to drive meaningful reductions in upstream Scope 3.

• And it can uncover a wide range of opportunities for companies to generate broader enterprise value beyond emissions reduction by creating more efficient, resilient, cost-effective and customer-centric supply chain networks.

The challenge of reducing emissions is enormous, but not insurmountable. **In this report, we explore how, with the right combination of visibility, actions and collaboration, we can reach our goals and put the planet on the road to a more-sustainable future.**

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Companies looking to decarbonize Scope 3 emissions are missing the mark.

While focusing their efforts on engaging Tier 1 suppliers, Accenture analysis reveals that **most companies' carbon intensity hot spots lie beyond their Tier 1 suppliers**, with intensity varying greatly depending on geographic location or network complexity. Companies need to drive multi-tier emissions visibility and regional supplier engagement strategies to create targeted impact at scale. This paper presents insights and actions for companies to accelerate the decarbonization of their supply chains.

Scopes 1, 2 and 3: What's the difference?

Scope 1 emissions are direct greenhouse (GHG) emissions that occur from sources that are controlled or owned by an organization (e.g., emissions associated with fuel combustion in boilers, furnaces, vehicles).

Scope 2 emissions are indirect GHG emissions associated with the purchase of electricity, steam, heat or cooling.

Scope 3 emissions are the result of activities from assets not owned or controlled by the reporting organization, but that the organization indirectly impacts in its value chain. Scope 3 emissions include all sources not within an organization's Scope 1 and 2 boundary. The Scope 3 emissions for one organization are the Scope 1 and 2 emissions of another organization.

Source: Environmental Protection Agency (EPA), United States

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Introduction

The United Nations Global Compact (UNGC) CEO study done in collaboration with Accenture says **the supply chain is the key to winning the battle against climate change**. That's because supply chains are the biggest contributor to the problem—they generate up to 60 percent of global emissions.[2]

Chief executive officers (CEOs) recognize the challenge. Of the global 2000 (G2000) companies, 34 percent have set an ambitious net zero target in line with climate science. Many companies have committed to net zero operations by 2040, or possibly earlier.[3] Many companies are already committed to powering their operations with renewables. So, the big priority is now shifting to efficiently measuring and reducing Scope 3 emissions.

Yet CEOs' intentions haven't translated into significant actions. According to a CDP survey,[4] only 10 percent of companies are tracking at least some elements of Scope 3 emissions. Of that small group, only 9 percent are achieving their emissions target. Chief supply chain officers must still balance what can often be conflicting priorities—cost, quality, service and now, sustainability. And in that equation, sustainability often takes a back seat. According to a recent Accenture survey,[5] just 22 percent of procurement leaders see sustainability as a top 3 priority.

Clearly, companies need to do more to address emissions to achieve their decarbonization goals. But it's not just about carbon. **A focus on eliminating Scope 3 emissions is critical because it can bring value beyond emissions**. Depending on their sector, companies are linking sustainability outcomes to their enterprise value creation agenda. This includes accessing premium customer segments, expanding market access, improving talent retention and attraction, lowering the cost of capital, mitigating regulatory disruption, improving resilience and mitigating risk.

Generating such benefits starts with gaining real visibility into Scope 3 emissions—particularly those coming from upstream suppliers. This, in turn, requires companies to truly understand all the sources of their upstream emissions—across every tier of their supplier base—and the differences in those sources at the supplying industry and country levels. These insights are the prerequisites to subsequently taking action to reduce Scope 3 emissions.

We know that companies that pursue a strategy of Total Enterprise Reinvention outperform their peers in this area. They deliver superior outcomes by thinking more deeply about how their reinvention will enable them to engage with customers and employees, deliver more sustainable outcomes and enhance their approach to innovation.

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Opening eyes to the opportunities

Gaining "n-tier" supply chain network visibility is necessary to identify the main drivers of upstream emissions—"hot spots." Such **visibility allows companies to see what's strategically important to the supply chain and where to focus their efforts**. An **Accenture**-developed data model enables the connections between different industries to be quantified, which in turn gives an accurate picture into the location and size of upstream greenhouse gas emissions.

Based on this data model, we've identified the insights and actions that will help companies accelerate the decarbonization of their supply chains.
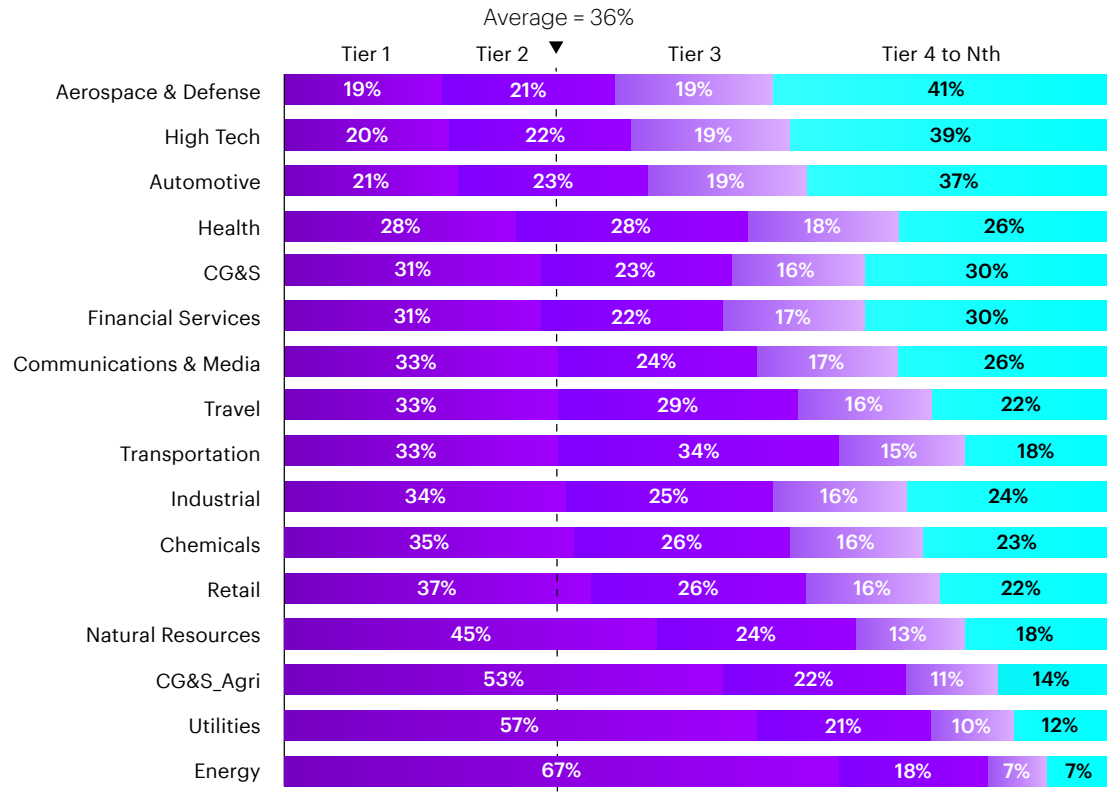
Insight #1
Nearly two-thirds of upstream emissions lay beyond Tier 1 suppliers and in geographically complex networks

Our research found the majority of upstream emissions for most industries lies beyond Tier 1 suppliers (Figure 1). Across all industries, Tier 1 suppliers are responsible only for an average of 36 percent of total upstream emissions. Industries like aerospace and defense, high tech, and automotive have approximately 80 percent of their upstream emissions coming from beyond Tier 1.

Industries that have less-complex supplier networks tend to have a larger portion of their emissions coming from their Tier 1 suppliers. These sectors include energy, utilities and natural resources.
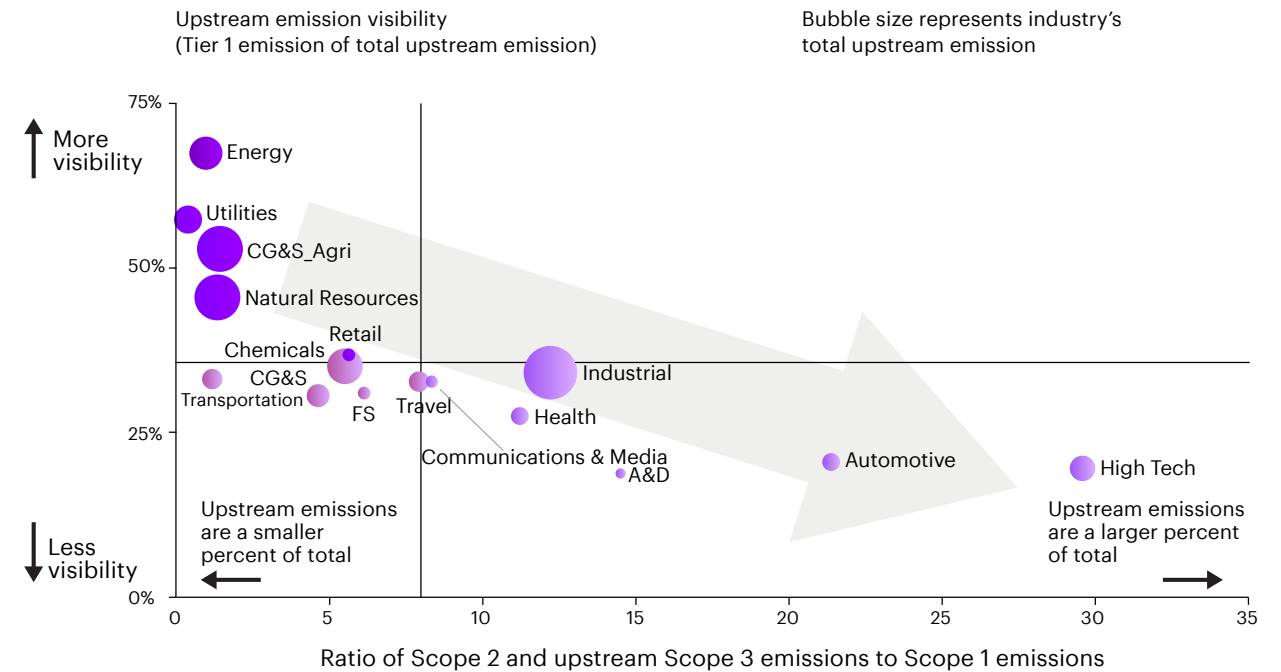
In most cases, if upstream emissions are a significant portion of a company's total emissions, they tend to occur deeper in the supplier network, as illustrated by Figure 2.

Figure 1: Distribution of upstream emissions by supplier tier

Average = 36%

Industry	Tier 1	Tier 2	Tier 3	Tier 4 to Nth
Aerospace & Defense	19%	21%	19%	41%
High Tech	20%	22%	19%	39%
Automotive	21%	23%	19%	37%
Health	28%	28%	18%	26%
CG&S	31%	23%	16%	30%
Financial Services	31%	22%	17%	30%
Communications & Media	33%	24%	17%	26%
Travel	33%	29%	16%	22%
Transportation	33%	34%	15%	18%
Industrial	34%	25%	16%	24%
Chemicals	35%	26%	16%	23%
Retail	37%	26%	16%	22%
Natural Resources	45%	24%	13%	18%
CG&S_Agri	53%	22%	11%	14%
Utilities	57%	21%	10%	12%
Energy	67%	18%	7%	7%

Source: Accenture Research analysis based on EXIOBASE 3 dataset, 2022

Figure 2: Upstream emission importance and visibility by industry

Upstream emission visibility
(Tier 1 emission of total upstream emission)

Bubble size represents industry's total upstream emission

More visibility

Less visibility

Upstream emissions are a smaller percent of total

Upstream emissions are a larger percent of total

Ratio of Scope 2 and upstream Scope 3 emissions to Scope 1 emissions

Source: Accenture Research analysis based on EXIOBASE 3 dataset, 2022

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Network and geographic complexity play a determining role too, as Figure 3 illustrates. In fact, some sectors have the most emissions within the same country and geography. Utilities, natural resources and agriculture benefit from relatively shorter value chains, while others (consumer goods and services (CG&S), communications and media, and aerospace and defense) have relatively complex upstream emissions.

Other sectors have more geographically dispersed sources of emissions, and while the energy value chain is relatively simple, others must face complex upstream value chains (e.g., automotive, high tech and chemicals).

| Figure 3: Upstream emission visibility and geographic dependence by industry
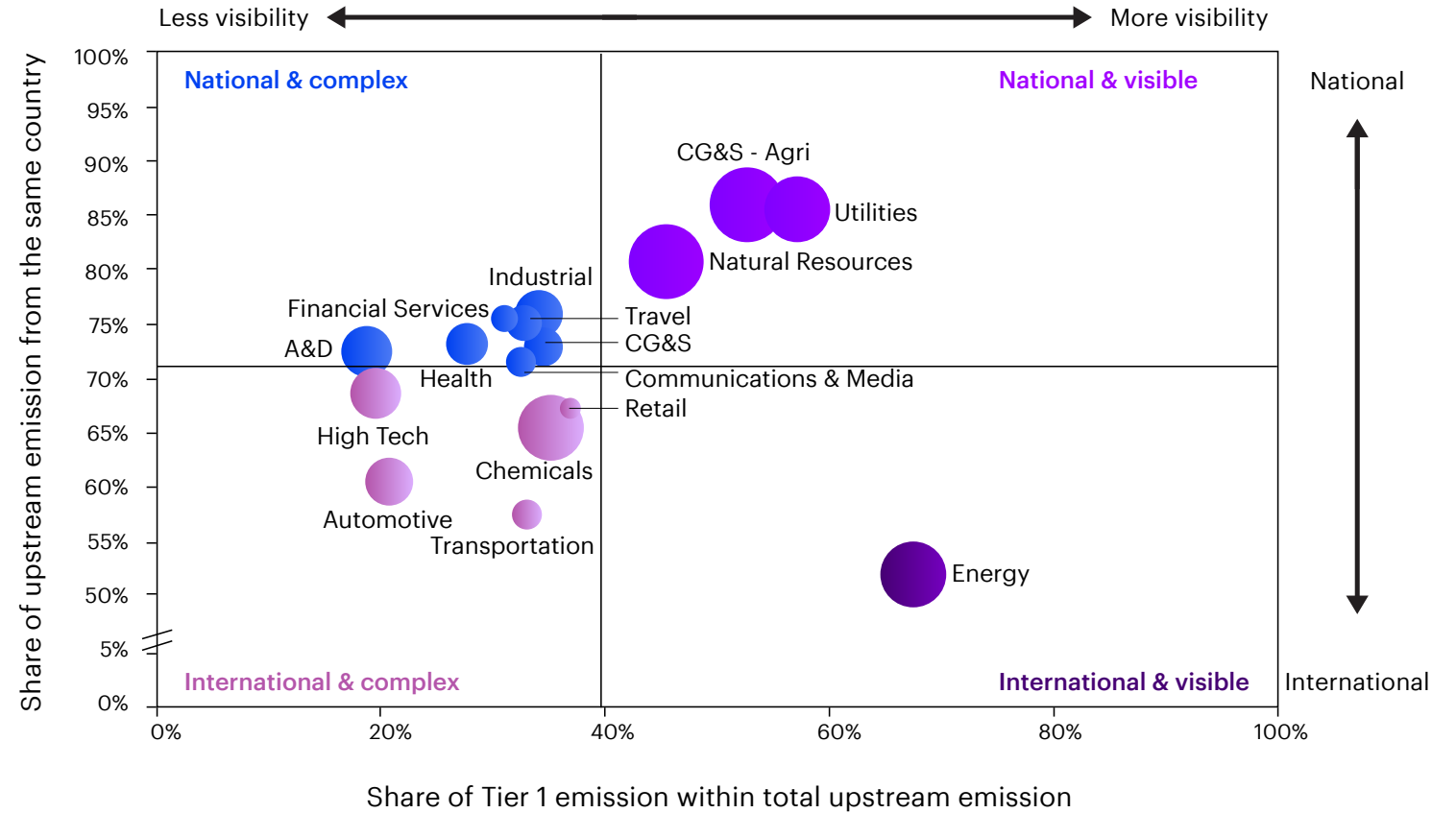
Bubble size represents the total upstream intensity of the industry

Source: Accenture Research analysis based on EXIOBASE 3 dataset, 2022

Insight #2
For nearly 50% of industries, real upstream hot spots differ from those represented by Tier 1 suppliers

The large sources of emissions ("hot spots") vary across industries (Table 1), and so do the targeted actions needed to address them. In many cases, the hot spots in deeper supplier Tiers (2 and beyond) are different from those in Tier 1 (Table 1, highlighted in green). To identify and target the right set of hot spots that will make the largest impact, visibility to suppliers beyond those in Tier 1 is essential.

Table 1: Upstream Scope 3 hot spots by supplier tier

Industry	Tier 1 hot spot	% of Tier 1 emissions	Beyond Tier 1 hot spot	% of beyond Tier 1 emissions
Aerospace & Defense	Metal processing suppliers	34.2%	Metal processing suppliers	18.7%
Automotive	Metal processing suppliers	26.3%	Petroleum and natural gas suppliers	17.7%
Consumer Goods & Services	Agricultural raw materials	64.0%	Agricultural raw materials	35.3%
Chemicals	Chemical suppliers	18.9%	Petroleum and natural gas suppliers	22.5%
Communications & Media	Transportation suppliers	10.9%	Petroleum and natural gas suppliers	17.1%
Energy	Petroleum and natural gas suppliers	80.8%	Petroleum and natural gas suppliers	39.1%
High Tech	Metal processing suppliers	29.5%	Petroleum and natural gas suppliers	17.6%
Industrial	Construction material suppliers	43.0%	Petroleum and natural gas suppliers	23.9%
Natural Resources	Petroleum and natural gas suppliers	26.1%	Petroleum and natural gas suppliers	27.8%
Travel	Agricultural raw materials	27.9%	Agricultural raw materials	33.3%
Utilities	Petroleum and natural gas suppliers	17.7%	Petroleum and natural gas suppliers	15.9%

Excluding purchased power generation (i.e., Scope 2)
Note: Highlighted in green are the industries where their hot spot beyond Tier 1 emissions is different from the Tier 1 emissions hot spot.

Source: Accenture Research analysis based on EXIOBASE 3 dataset, 2022

For instance, look at Figure 4. While for a food and beverage company in the United States the hot spot that can be identified in Tier 1 is also the hot spot across all tiers, this is not so evident in the automotive sector in Germany, where only multi-tier visibility reveals the real value chain emission hot spot, which might not be obvious just looking at the Tier 1 suppliers.

Without visibility into multi-tier emissions, companies may end up focusing and spending resources on actions that ultimately may not have a significant impact on reducing overall Scope 3 emissions.

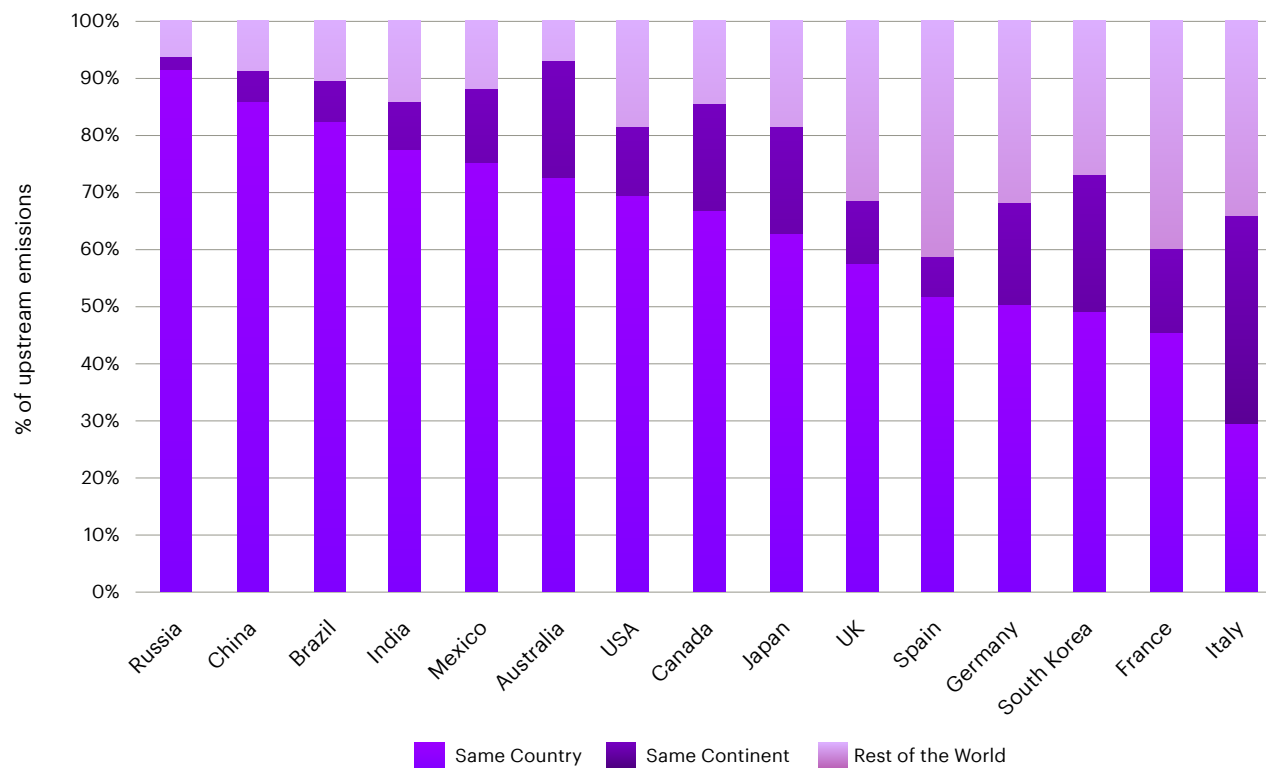| Figure 4: Sources of upstream emissions by supplier tier and industry
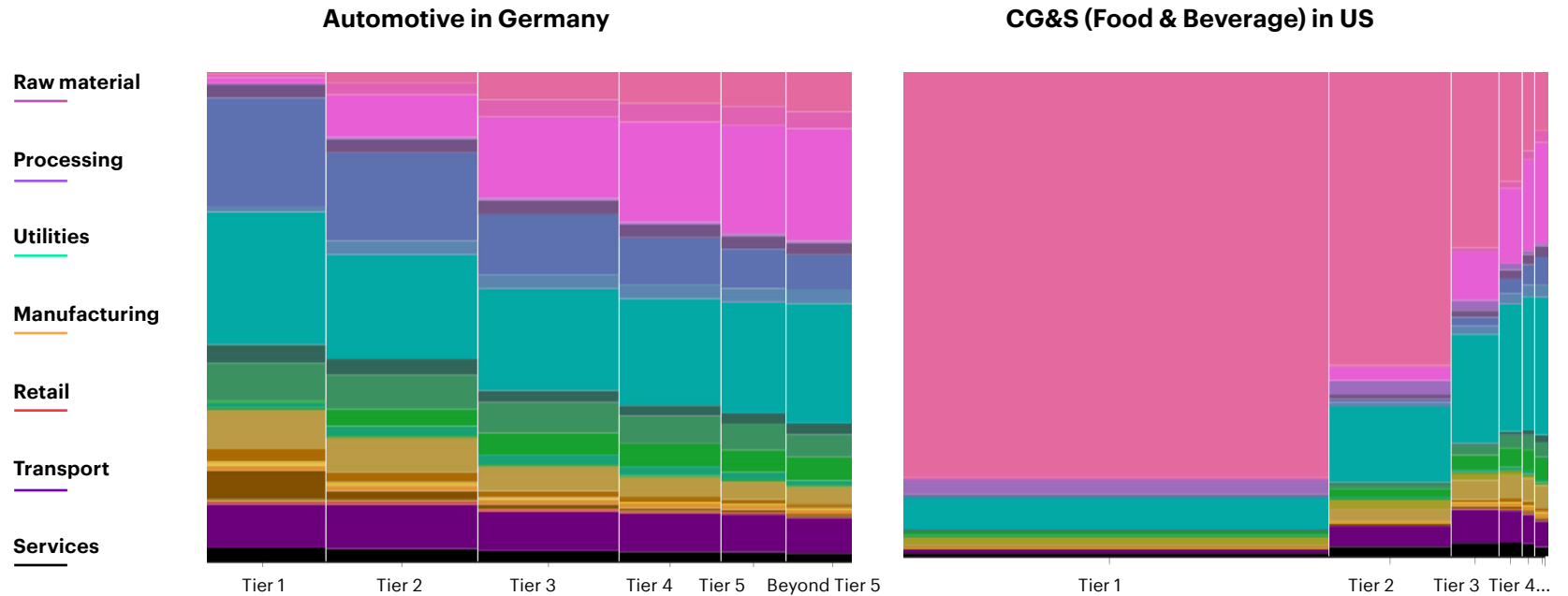
Source: Accenture Research analysis based on EXIOBASE 3 dataset, 2022

Insight #3
Geographical footprint of your supply chain matters, as it significantly influences your actual upstream emissions

The degree of dependency on local versus global suppliers varies by country, even in the same industry, which in turn has an impact on the amount and source of upstream emissions. This is clear when all industries are aggregated, as shown in Figure 5. Interestingly, the "BRIC" countries (Brazil, Russia, India and China) tend to have most of their upstream emissions concentrated within their country. Conversely, for European Union countries, the greatest percentage of upstream emissions tend to come from outside their borders.
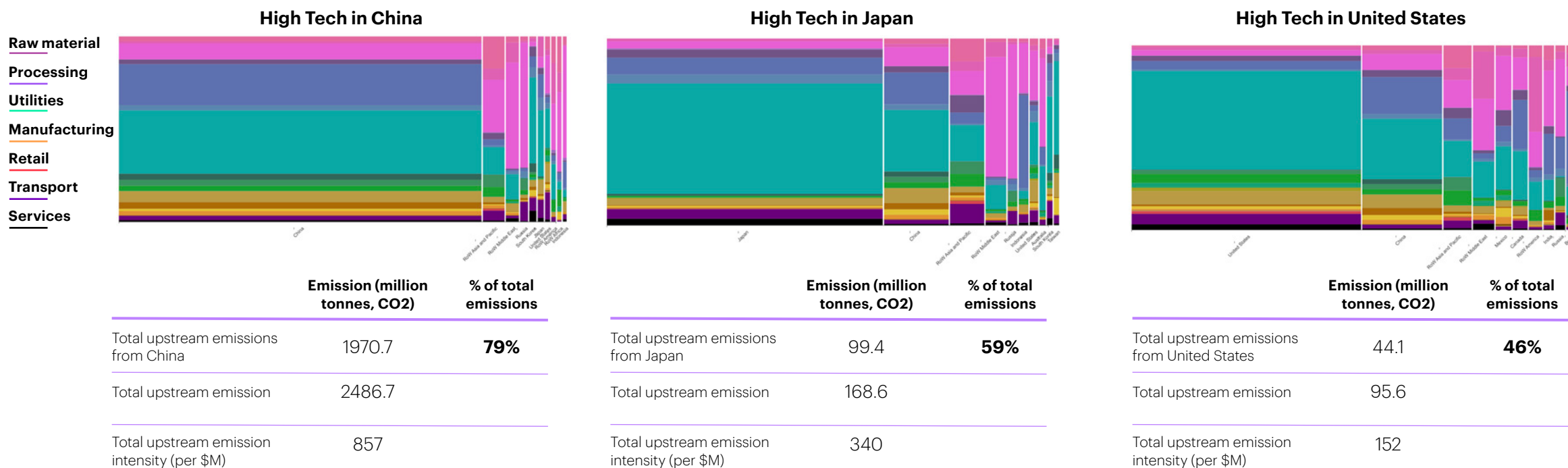

Figure 5: Geographic source of upstream emissions by country

Source: Accenture Research analysis based on EXIOBASE 3 dataset, 2022

Consider the high tech industry. As Figure 6 illustrates, **there's considerable difference in the geographic source of upstream emissions** for high tech companies in the United States, Japan and China. For Chinese companies, almost 80 percent of emissions are within the national borders; the figure is lower than 50 percent in the United States.

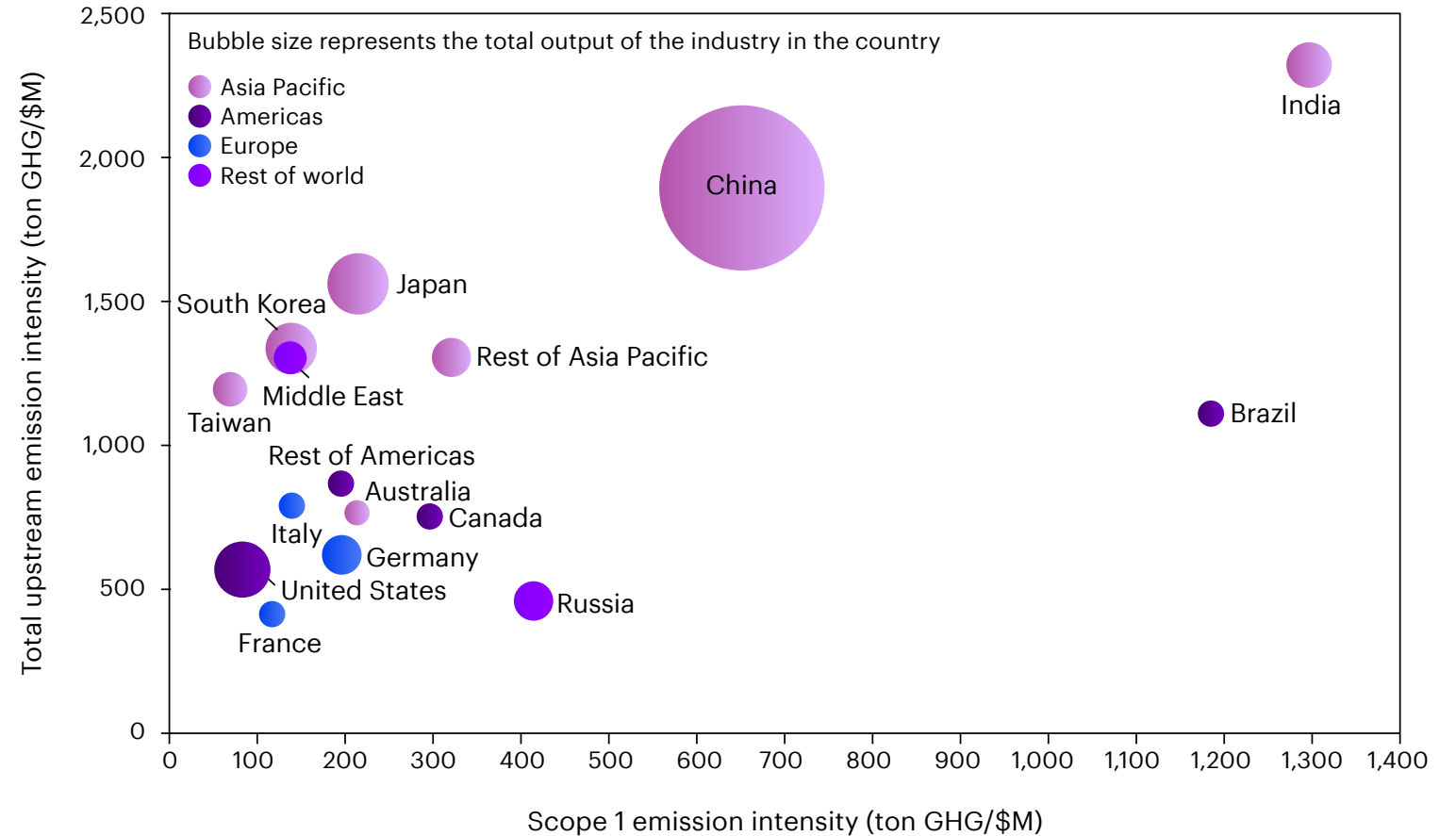| Figure 6: Difference between countries – high tech industry

High Tech in China

	Emission (million tonnes, CO2)	% of total emissions
Total upstream emissions from China	1970.7	**79%**
Total upstream emission	2486.7	
Total upstream emission intensity (per $M)	857	

High Tech in Japan

	Emission (million tonnes, CO2)	% of total emissions
Total upstream emissions from Japan	99.4	**59%**
Total upstream emission	168.6	
Total upstream emission intensity (per $M)	340	

High Tech in United States

	Emission (million tonnes, CO2)	% of total emissions
Total upstream emissions from United States	44.1	**46%**
Total upstream emission	95.6	
Total upstream emission intensity (per $M)	152	

Source: Accenture Research analysis based on EXIOBASE 3 dataset, 2022
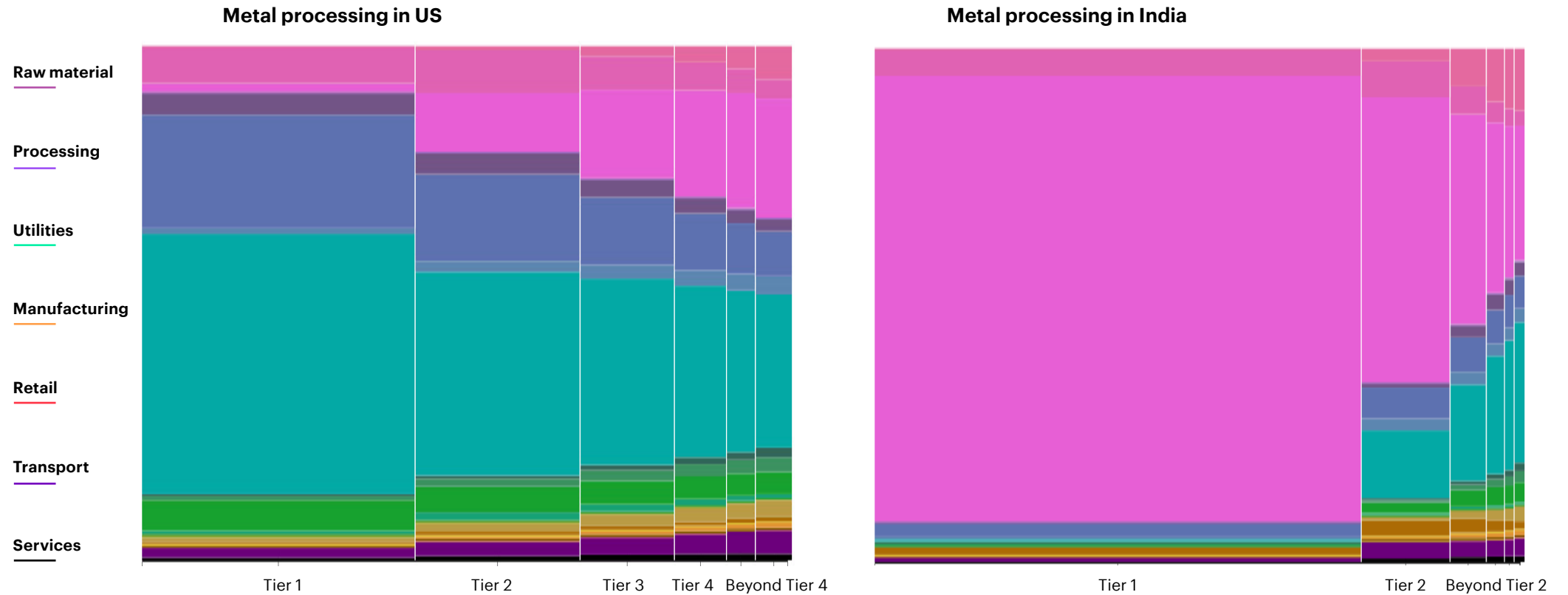
Emission intensity (emission per unit of purchase) within a specific industry also varies to a large extent by region. For example, in the metals industry, a country such as India has a much higher intensity for both Scope 1 and total upstream emissions compared with the United States (Figure 7). This intelligence can augment actions to strategically diversify the supplier base or strategically influence the flows of goods to avoid exposure to increased emissions due to geography.

Multi-tier visibility allows better understanding of the source of emissions and more accurate targeting of emission reduction efforts for each case (Figure 8).

| Figure 7: Metals manufacturing industry emission intensity (ton/$M)

| Figure 8: Metals industry upstream emissions, United States and India

Metal processing in US

Metal processing in India

Raw material

Processing

Utilities

Manufacturing

Retail

Transport

Services

Tier 1   Tier 2   Tier 3   Tier 4   Beyond Tier 4

Tier 1   Tier 2   Beyond Tier 2

Source: Accenture Research analysis based on EXIOBASE 3 dataset, 2022

Start moving faster

Five key actions from our insights

The preceding three insights are valuable for several reasons. They show how **transparency and data on upstream Scope 3 can help companies make their emissions actionable, auditable and reportable**. They can help companies identify where they can reduce potential cost, regulatory, reputation, and other risks and pressures that may exist in the supply chain, across both supplier tiers and geographies. In turn, companies can use data-driven insights to make better, more informed purchasing, design, manufacturing, planning, after-sales services, product end-of-life and other decisions that reduce end-to-end supply chain emissions. And companies can use these insights to focus the efforts of limited resources on the areas where action can have the biggest impact.

But companies need more than just visibility. To accelerate their progress in addressing Scope 3 emissions and generating greater enterprise value, they also need to act, fast-tracking their path to a data-powered digital core. Based on the insights from our research, we've identified **five key actions companies need to focus on now to begin making an impact.**

Building a digital core means pulling data, AI and technology into every part of the business to create an "intelligent operation."

First layer: Modern, cloud-based infrastructure and security layer that is automated, agile and secure by design.
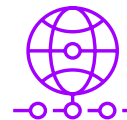
Next layer: Data and AI, which helps enterprises ask new questions and find new answers to drive decision-making. Functional and enterprise transformation is then enabled through re-platforming.

Action 1

Conduct a real multi-tier emissions hot spot analysis to set targets and drive the right actions

All upstream emissions aren't created equal and large sources exist hidden from normal view. Some supplying industries or countries can account for an outsized proportion of emissions compared with others. Therefore, to focus on what's most important, companies should conduct a detailed analysis of their supplier base to determine the biggest sources of emissions. The insights from such an analysis provide the foundation for an action plan to address the areas of most significant impact.

Accenture is currently working with a global pharmaceutical company to use their Tier 1 purchasing data to identify hot spots in their extended supplier network. Combining the results of the industry/country-level data model with company-specific relationship data, the locations of significant sources of emissions in Tiers 2 and 3 have been identified. These hot spots have been traced to the related Tier 1 suppliers, enabling the supply chain team to have **data-driven conversations with its suppliers that can lead to specific actions to reduce emissions**.

Action 2

Embed sustainability into category planning and supplier selection

With hot spots identified, a company can integrate activities to reduce emissions into spend category playbooks. The first step is to ensure environmental, social and governance (ESG) criteria are included in every step of the sourcing and decision-making process. Depending on the hot spot areas identified, a company can customize category plans, including emission-reduction strategies, to address hot spots as appropriate. Leading companies are already doing this for many Tier 1 suppliers. But they will have to **push such initiatives further upstream by helping Tier 1 suppliers apply the same principles to their purchases**.

A global financial services company set an ambition to build a leading procurement function with sustainability and responsible practices embedded throughout processes, technology and ways of working. To do this, the company established and drove an ESG procurement strategy with an actionable roadmap and embedded an ESG procurement policy across key documentation and processes. Finally, they educated sourcing teams through practical toolkits by providing initiatives to help achieve net zero, drive supplier diversity and eliminate modern slavery across the supply chain network.

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Action 3

Integrate emissions into the supply chain control tower and implement a digital twin

Control towers can help companies reduce Scope 3 emissions by centralizing visibility and decision-making and guiding actions with short- and long-term benefits. A powerful complement to a control tower is a digital twin of the supply chain that generates the end-to-end visibility necessary to optimize supply chain networks across service, costs, quality and sustainability—in real time. A digital twin leverages data to map physical material flows, uncover sub-tier suppliers and risks, **simulate the carbon footprint of the entire network**, and identify bottlenecks within the supply chain to help companies respond effectively to disruptive events.

Action 4

Support suppliers in their ongoing decarbonization efforts

With the right tools and resources, companies can proactively work with suppliers on an ongoing basis to help them improve their own decarbonization performance. **A supplier engagement program is critical to this effort**. Such a program should communicate emissions requirements. It should provide the necessary training and assistance to set science-based targets, baseline, report and improve ESG performance. And it should create incentive programs to motivate suppliers to accelerate their ESG journey. Segmenting the supplier base can help companies tailor their engagement programs appropriately. Finally, improving supplier data quality and accuracy enables a transition from spend-based emissions calculations to auditable, supplier-provided activity-level actual values.

An example of a supplier engagement program for ESG is one rolled out by an aerospace and defense manufacturer. The company recognized that suppliers were critical to its ability to achieve its sustainability objectives of decarbonization and transparency in the supply chain, zero forced labor, a culture of product safety and business integrity. The company formed four teams (comprising about 10 people specializing in sustainable supply chain principles) to run three targeted initiatives with the company's suppliers:

- **Supplier Code of Conduct**—This focused on achieving the highest standards of responsibility and safety principles throughout operations and supply chain. The goal is to have 80 percent of suppliers complying initially, and 100 percent by 2025.

- **Sustainability assessments and reporting**—This is geared toward ensuring suppliers' compliance with regulations and managing supply chain and reputational risk, while tracking toward net-zero emissions targets.

- **Data transparency**—This is designed to ensure the responsible sourcing of materials, including avoiding support of conflict minerals, for substances and materials purchased from 300 suppliers.

Action 5

Collaborate across your sector, with peers, suppliers and ecosystem partners to speed up decarbonization at scale

A significant challenge in meeting decarbonization goals is that companies across supply chains and industries rely upon often incomplete emissions data built on ad-hoc sharing. What is required is an intelligent operating model to **aggregate data from multiple parties and make recommendations on the most effective steps towards decarbonization**. These platforms require suppliers to commit to ongoing engagement. They must continually improve the quality of their data and act upon suggestions. Suppliers making clear progress are rewarded for their actions through incentive mechanisms as well as avoiding potential penalties or loss of business due to poor performance. This brings advantages to the customers of these suppliers, providing a more complete view of Scope 3 emissions so they can invest for the greatest impact.

We are already seeing examples of these collaborative platforms today, including Accenture's Sustainability Accelerator. Another example is Walmart's Project Gigaton,[6] created to mobilize suppliers on climate action by providing them with resources and innovation support to make it happen, all while reducing Walmart's own Scope 3. This includes supplier incentives ranging from advantageous financing programs for SBTi-validated targets to access to renewable energy.

Conclusion

Making meaningful progress on Scope 3

Carbon is central to the new definition of the supply chain role. For too long, the value the supply chain brings (especially its procurement function) was defined by the efficiency it could deliver. The scale of the challenge in reducing greenhouse gas emissions is massive. The supply chain has a responsibility to take a leading role and expand the types of value it delivers to the business.

The nature of emissions "changes the game" for the supply chain. It makes a multi-tier approach essential. **It's not enough for one company to meet its goals. Meaningful progress is only possible when all companies act**. As a result, supply chains must move away from the historic "supplier management"

approach of price negotiation and supply security. They now need to focus on a broader orchestration of the extended network. Only by working together on the shared problem can the shared benefit be realized.

The first step for companies is to gain deep visibility—to move from "what they thought they knew" to what's reality. **By combining such visibility with collaborative actions focused on the biggest upstream emissions hot spots, companies can fulfill their aggressive decarbonization commitments while significantly increasing the overall enterprise value that supply chains create**.

The scale of the challenge in reducing greenhouse gas emissions is massive. The supply chain has a responsibility to take a leading role and expand the types of value it delivers to the business.

Research methodology

Accenture Research built a data model to approximate upstream greenhouse gas emissions of different industries using a time series of environmentally extended multi-regional input-output tables. The dataset includes 163 industries and 49 geographic areas (44 countries and five rest of world regions).

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