

STATE OF SUPPLY CHAIN SUSTAINABILITY 2022

Adjustments and Equilibriums



STATE OF SUPPLY CHAIN SUSTAINABILITY 2022

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STATE OF SUPPLY CHAIN SUSTAINABILITY 2022

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CONTENTS

| | | | |
|---|----|--|----|
| Executive Summary | 1 | Implications of the State of Supply Chain Sustainability 2022 .. | 14 |
| Introduction | 2 | Out of the Covid-19 Crisis Came Opportunity | 14 |
| The Challenge of Defining Supply Chain Sustainability | 3 | A Steadily Increasing Heat with Occasional Flare-Ups..... | 14 |
| State of Supply Chain Sustainability 2022 | 5 | Change Is the Only Constant..... | 14 |
| Changes Over Time..... | 6 | Appendices..... | 15 |
| Covid-19 and Supply Chain Sustainability: Replication and Explanation | 6 | A. Contributors..... | 16 |
| Pressures: Turning Up the Heat..... | 8 | B. Translation and Reliability..... | 17 |
| Supply Chain Sustainability Goals: The Environment Bounces Back..... | 9 | C. Results of Global Comparisons | 18 |
| Put Your Money Where Your Mouth Is: Supply Chain Sustainability Investments..... | 9 | References | 19 |
| Changes Over Geography..... | 10 | | |
| Changes in Technology | 12 | | |
| SCS Practices: A Staircase Emerges | 12 | | |
| SCS Disclosures: A Steeper Summit | 13 | | |
| Increasing Involvement Across Business Functions..... | 13 | | |

FIGURES AND TABLES

| | |
|--|----|
| Figure 1: Respondents' age, gender, industry, and business function..... | 4 |
| Figure 2: Change in supply chain sustainability (SCS) commitment in 2021..... | 6 |
| Figure 3: Change in SCS commitment by region..... | 7 |
| Figure 4: Firm size by region | 7 |
| Figure 6: Sources of SCS pressure..... | 8 |
| Figure 5: Level of pressure from top 2021 sources year over year | 8 |
| Figure 7: Goal change from 2019–2021 | 9 |
| Figure 8: Gap between goals and investments | 9 |
| Figure 9: Environmental SCS goals in the Global North and Global South | 10 |
| Figure 10: Social SCS goals in the Global North and Global South | 10 |
| Figure 11: Environmental SCS investments in the Global North and Global South | 11 |
| Figure 12: Social SCS investments in the Global North and Global South | 11 |
| Figure 13: “Staircase” of SCS practices | 12 |
| Figure 14: “Staircase” of SCS disclosures | 13 |
| Figure 15: Respondents by level of engagement with their firms' SCS efforts | 13 |
| Table 1: Reliability results for survey translations..... | 17 |
| Table 2: Results of regional comparisons of SCS pressure sources/influences, goals, and investments | 18 |

EXECUTIVE SUMMARY

If there is one characteristic that sums up the state of supply chains today it is the need to navigate extreme change. Our research over the last three years culminating in the 2022 State of Supply Chain Sustainability Report shows the same can be said for supply chain sustainability (SCS). SCS is a moving target.

For instance, over the last three years consistent pressure to pursue SCS goals has come from various stakeholders, but the relative level of pressure associated with each stakeholder has changed over time. This year, company executives and corporate buyers top the league of advocates. As one of the executives interviewed for this year's report commented, customers want to buy from companies that are investing in, and are committed to, SCS. Geographically, the Global North and the Global South give different weightings to the components of SCS. For instance, the North shows stronger commitment to climate change mitigation than does the South. This is the first year we have tracked differences between SCS goals across regions of the world—supported by a multilingual survey questionnaire—so it will be interesting to see how these disparities evolve over future years.

While the individual components of SCS may be in a state of flux, overall, the importance of sustainability in supply chains continues to trend upwards. The dimension that showed the most positive change is climate change mitigation. Supply chain circularity also gained favor in 2021. The adoption of technology and practices to support SCS goals also appears to be on the rise. Our latest research suggests that supplier audits, supply chain mapping, and codes of conduct are the most prevalent practices regardless of firm size.

The steady rise of SCS as a corporate issue may come as no surprise to many supply chain professionals. Our research for the 2022 report affirms supply chain's increasingly important role as a champion of corporate sustainability—a trend we highlighted in last year's report. Given their key role in supporting sustainability goals, it is incumbent on practitioners to keep abreast of the many agents of change in this area, whether they be inspired by media channels, shifting consumer sentiment, or unexpected disruptions.

However, while SCS may be enjoying more support as a corporate goal, its growing popularity does not necessarily translate into investment dollars. As was the case in previous years, on every dimension SCS goals ranked more highly than investment in 2021. Still, the investment picture is not unremittingly gloomy. There are tentative signs that the gap is closing in some areas, notably in human rights protection.

What does 2022 portend for the future of SCS? We have no reason to doubt that SCS will continue to gain importance in the near term. Even the Covid-19 pandemic and its aftermath did not arrest this trend. For the second consecutive year, about 80% of respondents reported that their firms were undaunted by the global pandemic. Moreover, our research suggests that one of the pandemic's legacies is to promote new thinking in key supply chain areas such as SCS.

The Rubik's Cube of SCS components may continue to change, but sustainability practices and capabilities in supply chains appear to be maturing fast while gaining momentum across firms of all sizes.

INTRODUCTION

This is an essential read for anyone in supply chain today. Supply chains worldwide are uniquely positioned to be an engine to impact our society positively. The choice of who we choose to do business with, where we do business, and what and how we deliver is essentially in the supply chain's control. Consumers and businesses alike need—and, in fact, demand—that products we source and deliver meet their environmental and social expectations. You will find in the State of Supply Chain Sustainability 2022 a most important, comprehensive global study that supports your ability to benchmark your company and SCS actions.

—Mark Baxa, *President and CEO, CSCMP*

The annual State of Supply Chain Sustainability report is a co-presentation of the MIT Center for Transportation & Logistics and the Council of Supply Management Professionals. This yearlong research effort includes a globally administered survey, semi-structured executive interviews, and a thorough review of the year's news and media documents related to global sustainability. Each year, the research team has collected and collated those disparate data points into this report, which we hope offers its readers a clear snapshot of the current state of supply chain sustainability worldwide.

In 2019, the first year of data this report studied, we found widespread interest in a broad spectrum of environmental and social dimensions of sustainability among participating supply chain professionals.* We also found that roughly half of respondents reported that they felt their firm was under pressure to improve its sustainability efforts, a finding that has been consistently replicated in subsequent installments of the State of Supply Chain Sustainability report.¹ In 2020—the first year where we could make year-over-year comparisons—we expected to find a lagging or decreased focus on supply chain sustainability efforts due to the Covid-19 pandemic. However, to our surprise, we found that global supply chain sustainability (SCS) efforts remained as strong as ever; a whopping 82% of respondents reported that their firms' commitment to supply chain sustainability had remained constant

or increased from 2019, even in the face of the pandemic—especially for larger firms. The notable changes we did observe had to do with who was exerting this pressure on firms' SCS efforts and how firms prioritized sustainability dimensions. From 2019 to 2020, we saw the most growth among social sustainability dimensions like employee welfare and safety; human rights protection; local community impact; and supplier diversity, equity, and inclusion. And as to who was exerting pressure on firms in these areas, the biggest increase in 2020 came from investors and governmental authorities.²

This year marks the third installment of the annual State of Supply Chain Sustainability report. We are very pleased that the report has collected data from a larger group and wider range of people each year. And this year, we were able to offer the survey in Spanish and Mandarin Chinese in addition to English, allowing for diverse, robust responses from all corners of the world. While in prior years we had collected data from respondents worldwide, these new translations allowed us to reach more people from more regions to enable us to conduct another layer of statistical analysis.

This large undertaking would not be possible without our outstanding team of sponsors, students, and contributors (listed in Appendix A). We hope that readers find our results both interesting, and useful. If you do, there is a large team to thank.

* See Figure 8 for a full listing of these supply chain sustainability dimensions.

The Challenge of Defining Supply Chain Sustainability

A motivating premise of this research is that the term *supply chain sustainability* (SCS) means a range of different things to different people. Specifically, which areas should be included in a firm's supply chain sustainability efforts? Which opportunities should be prioritized? Should climate change mitigation be included? What about diversity, equity, and inclusion (DEI)? From a scientific perspective, this poses a quandary: How can we ask people about a topic without first defining it? But conversely, how can we define it without unduly influencing their responses?

Since year one, we have chosen to resolve this research quandary by appealing to an especially broad definition from a globally recognized source. We base our definition of supply chain sustainability on the United Nations Sustainable Development Goals.

As defined in previous years:

We define supply chain sustainability as the management of environmental and social impacts within and across networks consisting of suppliers, manufacturers, distributors, and customers in line with the UN Sustainable Development Goals. This spans every phase of the supply chain, from raw material sourcing and extraction to product use and end of product life.

This is, admittedly, a very broad definition that allows for difference of opinion. We believe that this dissensus around supply chain sustainability is important—not only academically interesting, but managerially relevant as well. Our work indicates that sustainability pressures, goals, and practices change over time and vary by geography and industry. Consider then that supply chain professionals are responsible for projects that extend across international boundaries and various industry sectors, and for overseeing timelines that span multiple years. As one North American interview subject working in healthcare logistics told us, “As we work with different suppliers and start opening up discussions on their sustainability issues, or [as we have] similar discussions with customers, what we find is that each company's North Star, per se, is a little bit unique to what they do.” Therefore, knowing where and how supply chain sustainability is interpreted differently is crucial for firms in order to meet their goals as times and contexts change. We hope that our ongoing efforts will help supply chain management professionals to keep abreast of—and even ahead of—these changes, for the good of business, society, and the planet.

Research Approach

This year's online survey was prepared in three languages: English, Spanish, and Mandarin Chinese. The survey was released worldwide on October 25, 2021, and remained open until December 27. The survey yielded more than 3,300 usable responses. Survey responses are completely anonymous; we do not collect

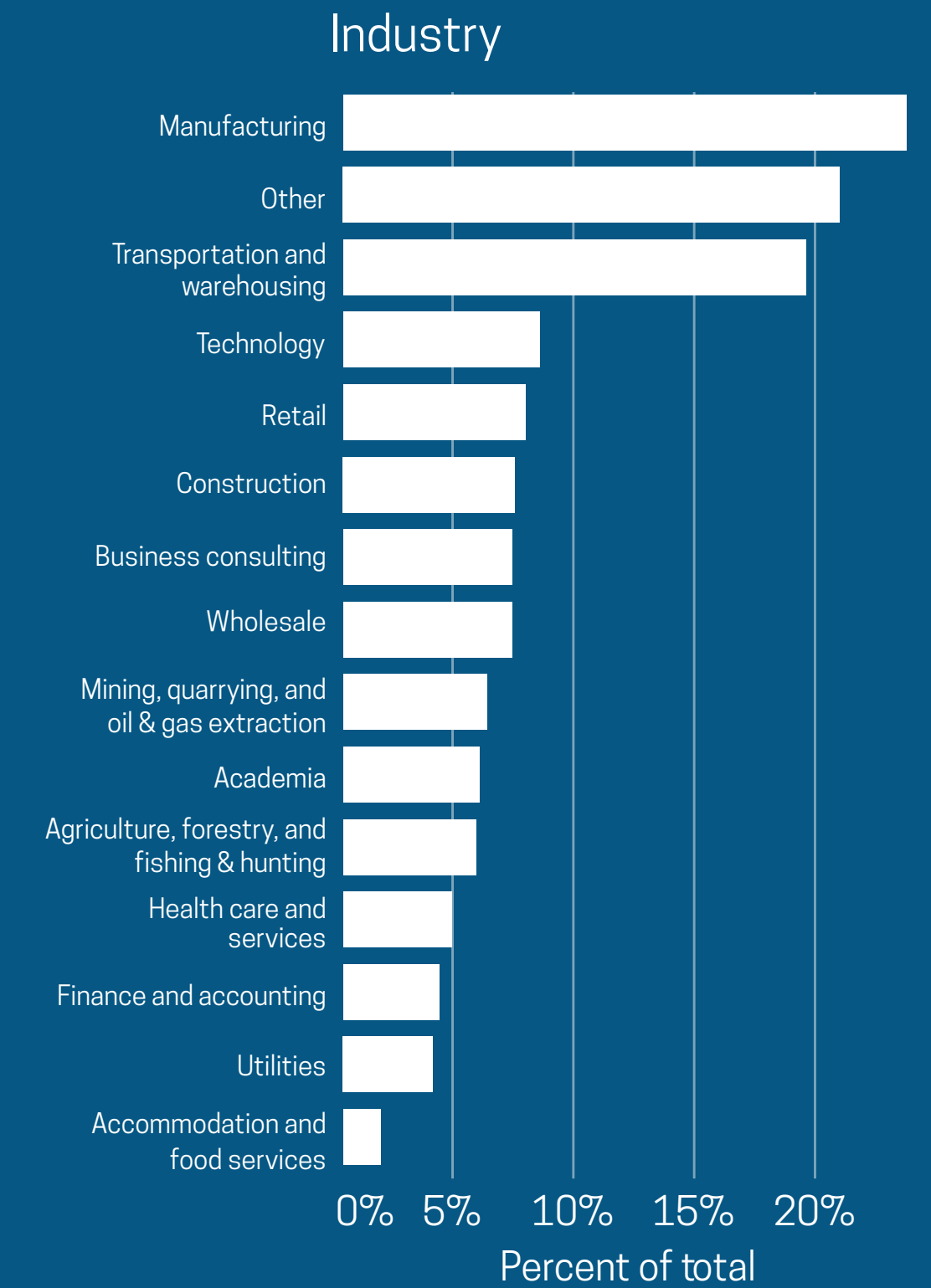
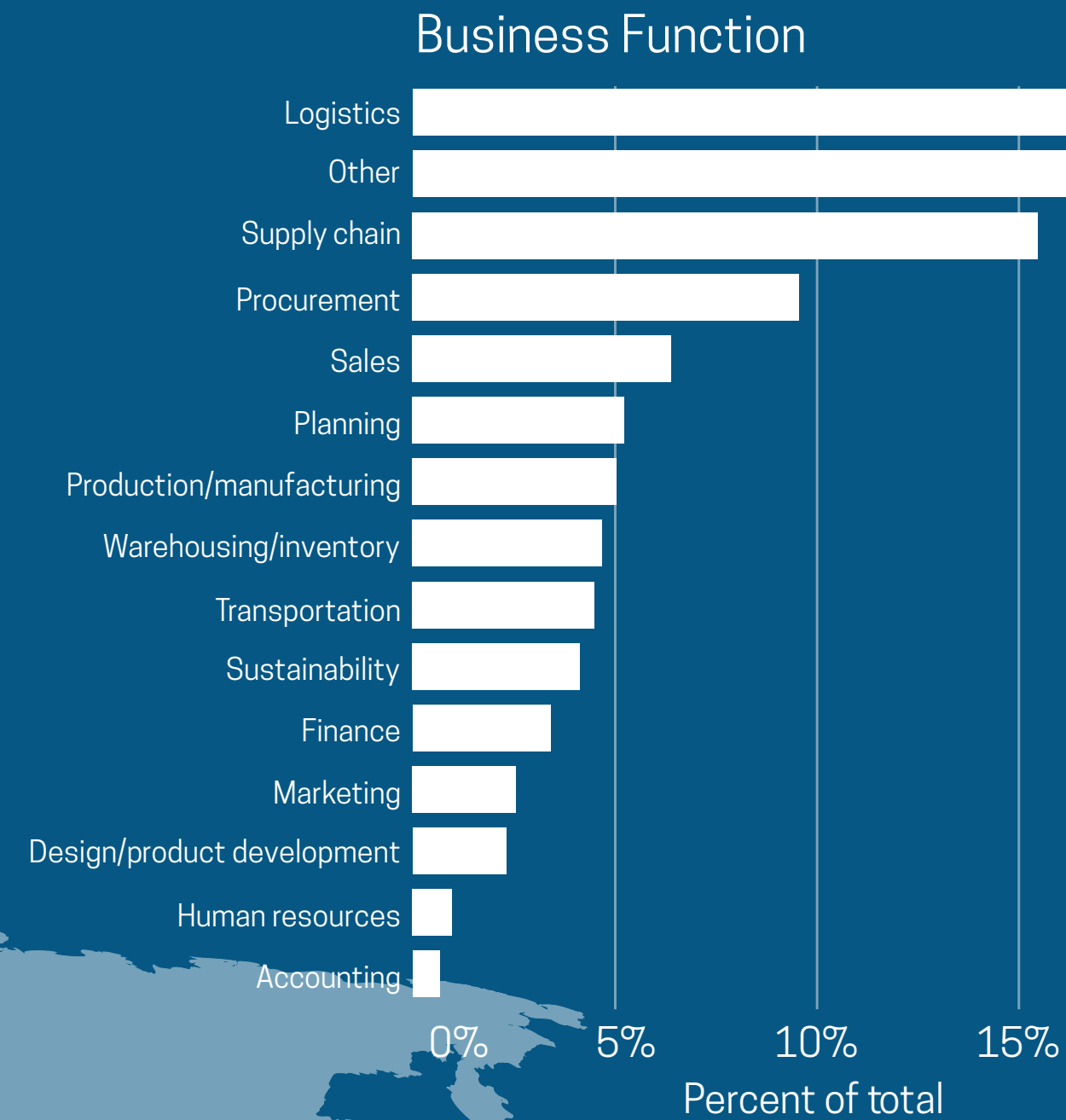
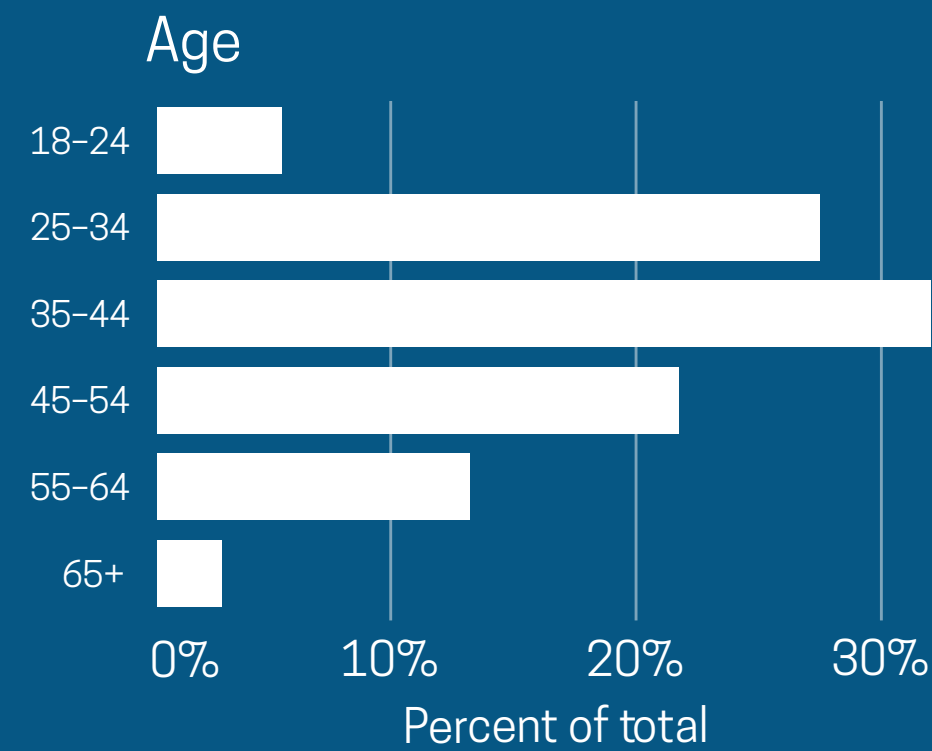
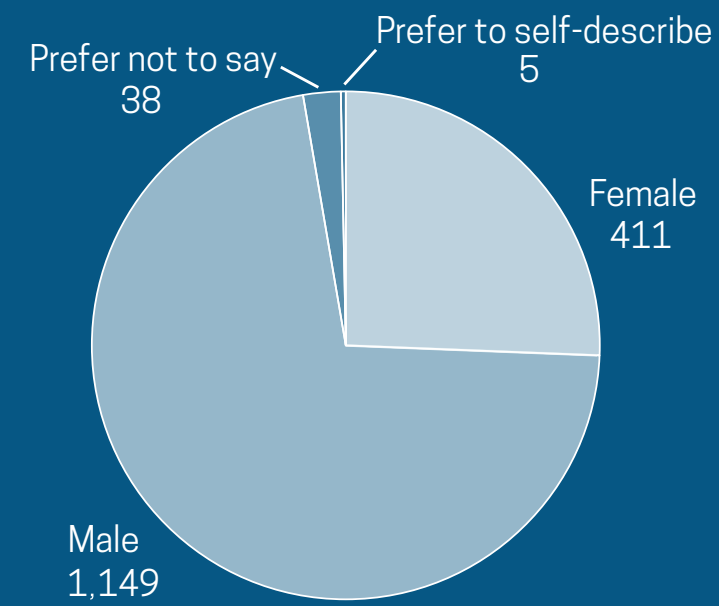
any information that individually identifies respondents or their employers.

To assess the quality of the translations, we ran two tests: one before the survey launched and one after it closed. First, after both the Spanish and Mandarin translation teams completed their first translation, the translation teams walked through their work side by side with the MIT CTL research team. In these sessions, each translated term was discussed and described using other words to make sure the intended meaning was communicated across languages and cultures. Wherever any confusion popped up, we consulted additional native speakers to evaluate the translation and offer suggestions. Secondly, after the survey was closed, we conducted a Cronbach's alpha test on all responses, testing for statistical reliability within and across translations, which showed acceptable results. When tested both in aggregate and broken down by language, the results passed this reliability test. (For more in-depth discussion of our research approach and methodology, see Appendix B.)

We also conducted 15 executive interviews. These interviews served two purposes: First, insights from these professionals guided the analysis conducted by our research teams. Second, excerpts from those interviews are also included in this text to give practical illustrations of our findings.

When making year-over-year comparisons, we chose to compare only English-language responses from each of the three years. Our reasoning is that we observed statistically significant differences in the responses from the new language groups compared to the English language group such that it would not yield a valid one-to-one comparison. For the same reason, when we compare responses by region, only the data collected in 2021 is included. Geographically, we received enough responses to achieve a viable sample size from employees of firms headquartered in five regions: North America, Latin American & the Caribbean, Europe, Asia, and Africa. Unfortunately, we did not receive a large enough sample of employees from firms in the Middle East or Oceania to reliably analyze and compare their results to other regions. The demographics and geographic locations of our respondent group are shown in Figure 1.

Respondents



3,300+ Survey Respondents

3 Languages

15 Executive Interviews

Figure 1: Respondents' age, gender, industry, and business function (n = 1,622)

State of Supply Chain Sustainability 2022



Changes Over Time

Covid-19 and Supply Chain Sustainability: Replication and Explanation

For the past two years, we have asked the question “Since the start of Covid-19, my firm’s commitment to supply chain sustainability has...” And for the last two years, we have received almost identical results from the English-language respondents. In 2021, 30% answered that their firms’ commitment had increased, and 47% said it stayed about the same. This means that for the second consecutive year, roughly 80% of respondents reported that their firms were undaunted by the global pandemic.³ This replication of results adds support to our previous conclusion that approximately 80% of firms held fast to their supply chain sustainability goals during the Covid-19 pandemic.

To many, these results were counterintuitive. How could a global pandemic not derail supply chain sustainability (SCS) efforts?⁴ But this year, our qualitative research offered another interpretation. In our semi-structured executive interviews, we heard several respondents describe how the pandemic actually brought supply chain management—and in particular, supply chain transparency and resilience—to the fore in a way that it never had before. Previously, global supply chains simply ran silently and unseen in the background of business operations and day-to-day life. In 2020, we began to see emerging evidence of firms shoring up—and even accelerating—their SCS efforts as a risk management measure and a way to strengthen their supply chain resilience.⁵ And in 2021, we see this idea spreading and taking hold more broadly.

In 2021, since the start of Covid-19, my firm's commitment to supply chain sustainability has...

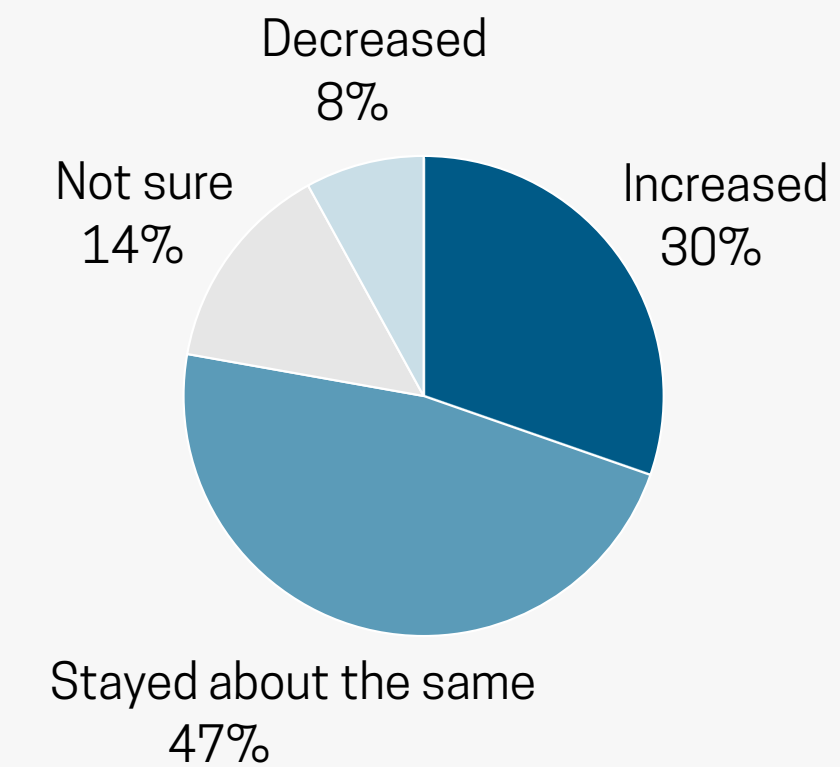


Figure 2: Change in supply chain sustainability (SCS) commitment in 2021 (n = 1,694)

In the face of constant disruptions, leading companies worldwide are urgently redesigning their supply networks and ecosystems to not only address business continuity and resilience, but also to improve their supply chain for sustainability, which is a very high priority for internal and external stakeholders alike.

—Hong Mo Yang
Senior Vice President for Industry Strategy, Blue Yonder

One interviewee from a global electronics manufacturer summed up this driving force: “A tremendous amount of supply chain disruption has challenged us to look at what we can do different, what we can do better.” Similarly, another third-party logistics professional from North America told us, “The visibility and the awareness of the supply chain, and with that the attention that was focused on bringing different solutions to market gives us the ‘air cover’ that we need to offer things like EVs (electric vehicles) and distributed warehousing solutions.” However, we also see that the global commitment to supply chain sustainability has not been as robust in the face of the Covid-19 pandemic as the English-only responses of past years would suggest. When reconsidering this

same question regionally, we see differences in the impact of Covid-19 by the region where respondents’ firms are headquartered. Notably, a smaller percentage of respondents working for firms headquartered in Latin America & the Caribbean reported their firm’s commitment to SCS increased since the start of Covid-19. As one respondent from Latin America said, “The pandemic stopped these agendas for the last two years.”

Our previous reports highlighted that firm size is an important factor in commitment to supply chain sustainability, and that proved true again this year.

How has your firm's commitment to supply chain sustainability changed since the start of Covid-19?

■ Not sure ■ Decreased ■ Stayed about the same ■ Increased

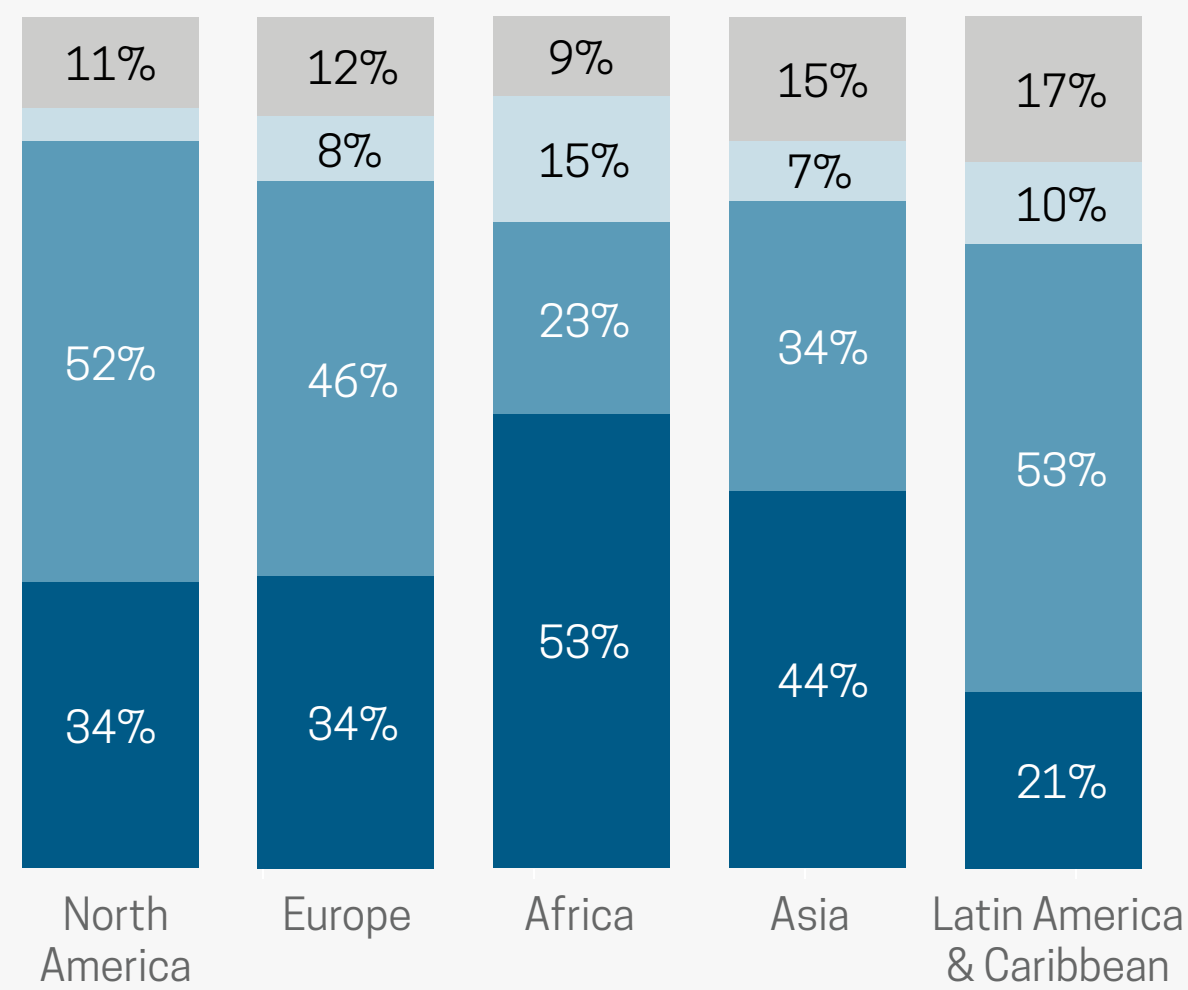


Figure 3: Change in SCS commitment by region (n = 1,533)

How many employees does your firm have?

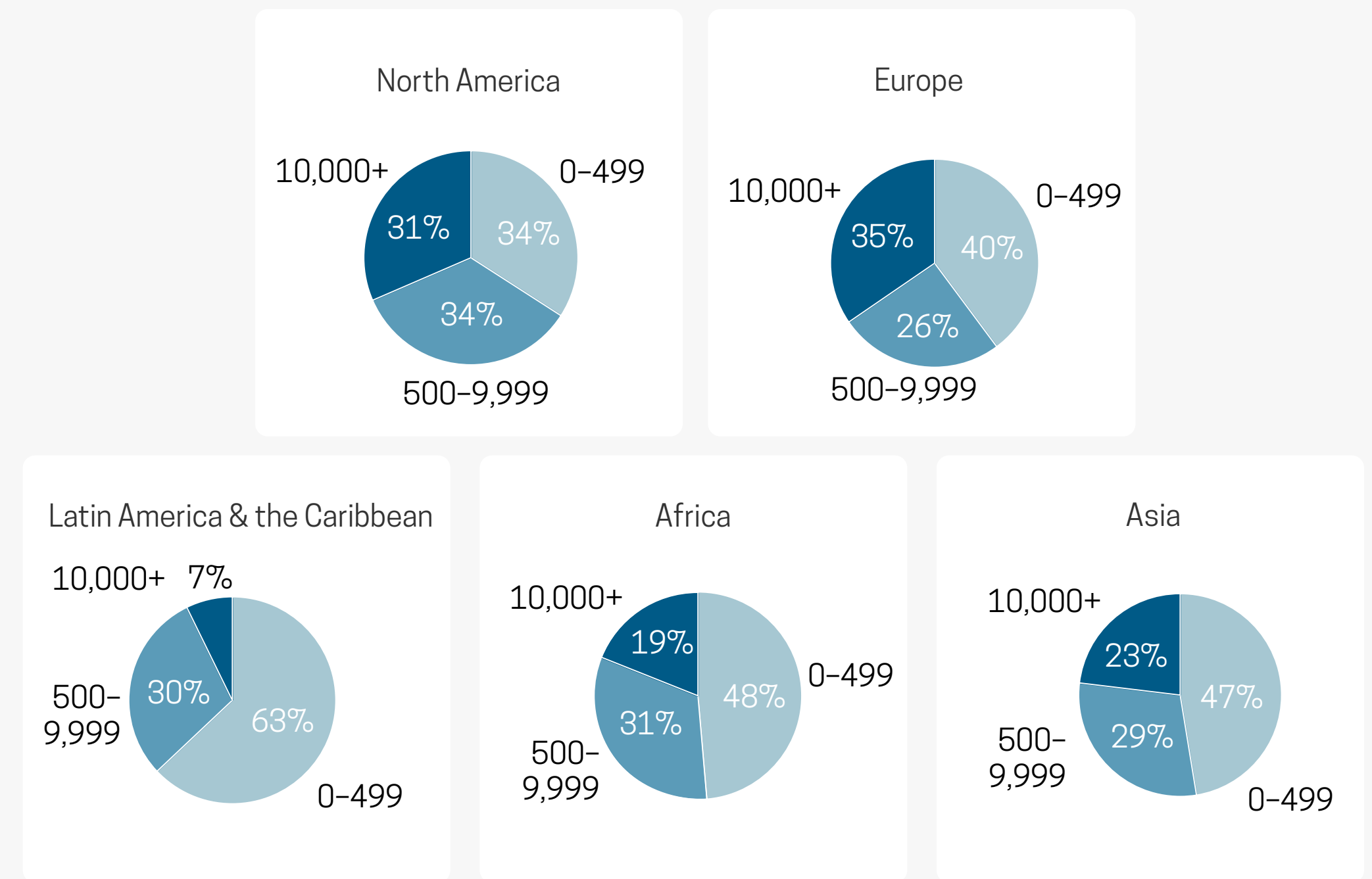


Figure 4: Firm size by region (n = 305)

Pressures: Turning Up the Heat

Since 2019, we have asked survey respondents to rank the level of pressure that their firm faces to increase supply chain sustainability from 10 different potential sources along a 5-point Likert scale. Those responses typically cluster around the 3–4 (“high” to “very high”) range. However, some pressure sources show significant changes over time. To see where there were meaningful shifts in responses over time, we compared the average response for each year in Figure 5.

Figure 5 shows how sources of pressure change over time. We see that almost every source of pressure shows an increase over three years of observation, with pressure from investors rising most dramatically, followed by pressure from corporate buyers. This sentiment was also captured in this year’s executive interviews. An interviewee from a global electronics manufacturer explained, “I think we’re seeing more and more that our customers—both our direct customers and our indirect customers—are expecting

it, or in some cases demanding it. They are looking to only purchase from companies that are investing in sustainability and are committed to being leaders in that space. I think there is a much stronger pull from the customers for it.” And another respondent from a North American logistics firm told us, “I think pressure primarily comes from organizations who are manufacturing that product and shipping it applying that pressure to carriers who are taking that product. Most of the environmental initiatives that carriers are asked to carry out cost them money. In some respects, they’re doing it because they are being required to do it.”

This anecdotal information, combined with the data shown in Figure 5, indicate strong B2B pressure in 2021. That is, it’s not external watchdog groups like NGOs, regulators, or the media who respondents felt ratcheting up the pressure in 2021; rather, it’s their own customers, leadership, and creditors. Overall, this indicates that in the fall of 2021, commercial

pressure to improve supply chain sustainability was at least as prominent—if not more so—than regulatory or public pressures. The recency of this shift toward commercial SCS pressure can also be observed in Figure 6, where the pressure that respondents reported sensing from company executives and investors increases steadily, but by contrast, pressure from corporate buyers remains flat but jumps sharply from 2020 to 2021.

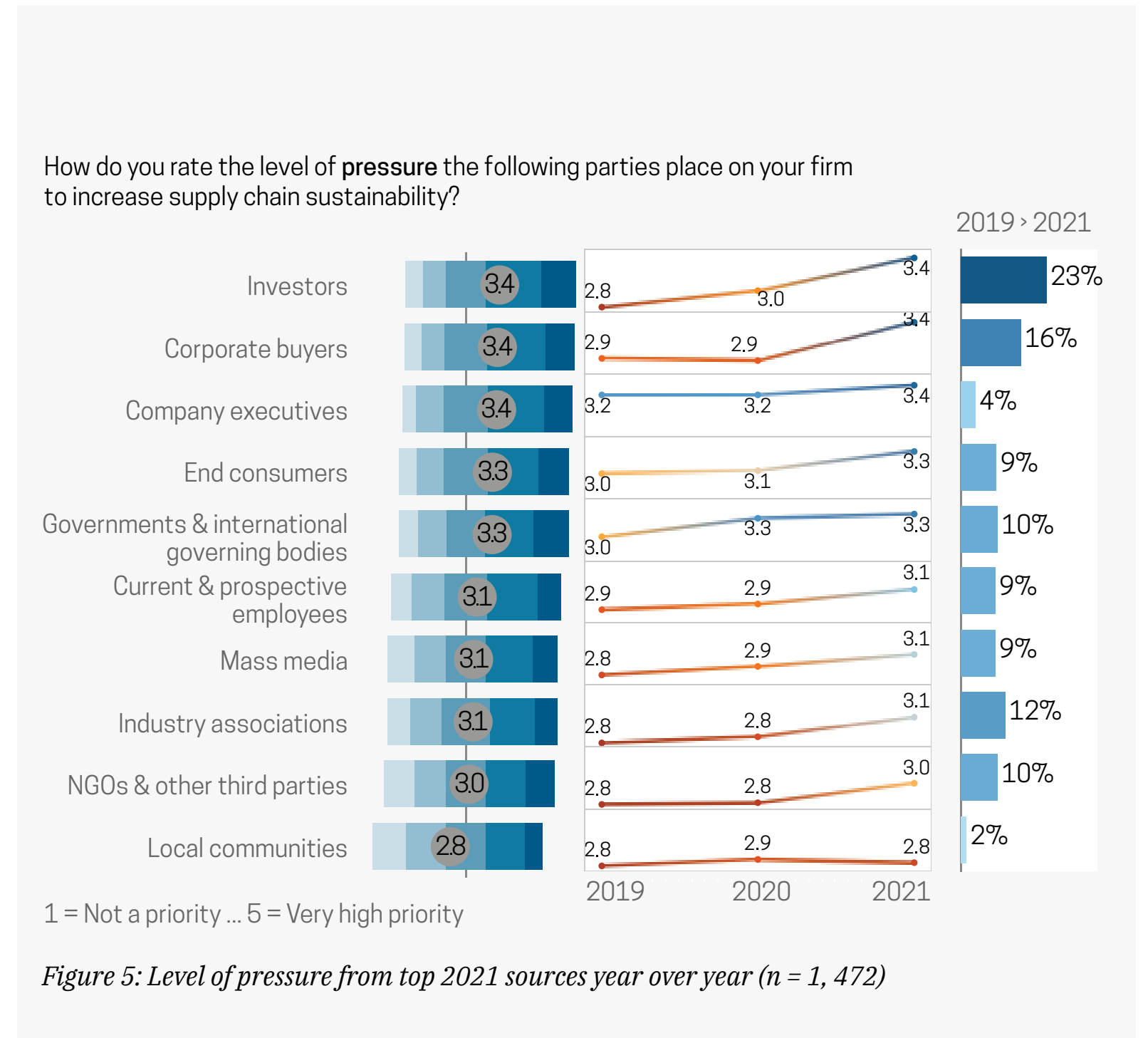
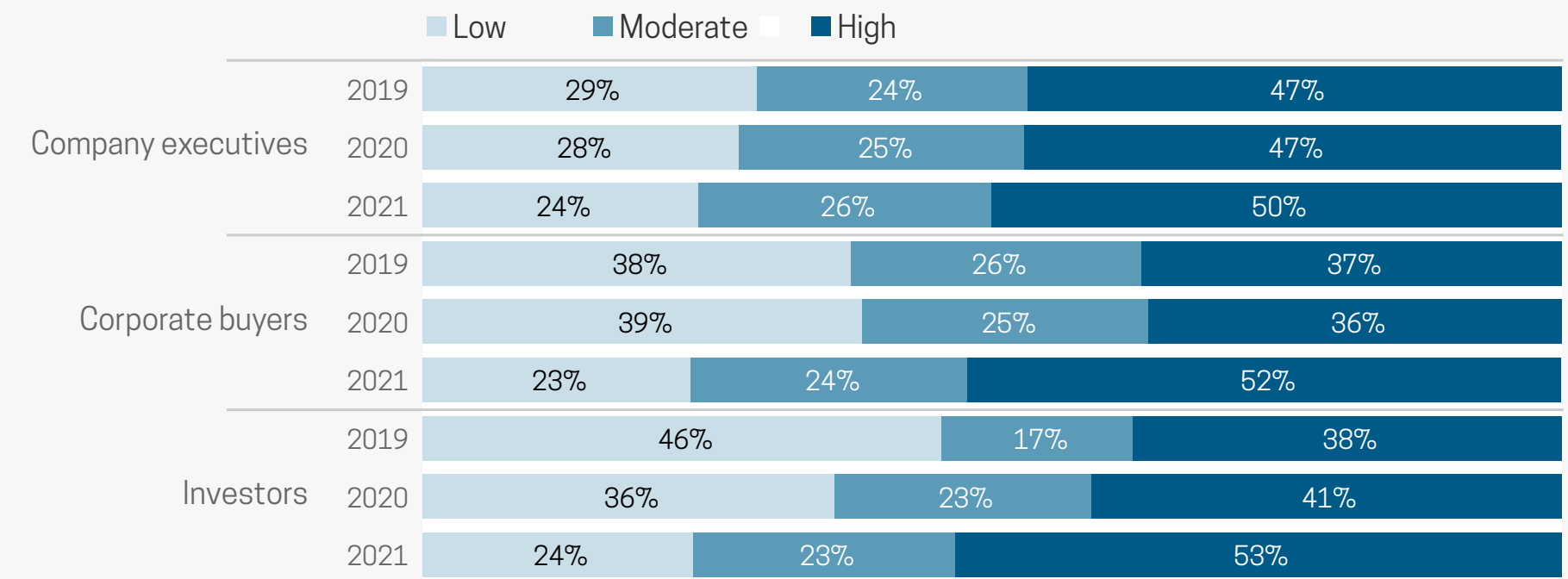


Figure 5: Level of pressure from top 2021 sources year over year (n = 1,472)

Customer demand is a major driver of supply chain sustainability initiatives. Firms we work with are looking for ways to reduce supply chain emissions and adopt more sustainable practices in response to that customer demand. This is the case even in markets where regulatory pressures are not as ambitious.

—Christian Piller
Vice President for Research and Sustainability, project44

How do you rate the level of pressure the following parties place on your firm to increase supply chain sustainability?



Low = 1 (No pressure), 2 (A little pressure), Moderate = 3 (Some pressure)
High = 4 (Moderate pressure), 5 (Intense pressure)

Figure 6: Sources of SCS pressure (n = 1,136)

Supply Chain Sustainability Goals: The Environment Bounces Back

Once we understood variation in pressure sources, we looked to understand how respondents evaluated their firms' supply chain sustainability goals. Like the approach we applied to understanding sources of SCS pressure, we compared the responses across 10 different dimensions of sustainability over the three years of survey data.

Again, for each sustainability dimension, responses mostly coalesced around an average score of 3.5. However, every dimension shows change year over year. And when comparing

2020 to 2021, every dimension shows an increase.

Interestingly, commitment to climate change declined from 2019 to 2020 but then shot up significantly from 2020 to 2021. This was also true of respondents' prioritizations of supply chain circularity. At the same time, commitment to social issues, including human rights protection; supplier diversity, equity, and inclusion; and fair pay and fair trade continue to make steady increases every year from 3 ("high") in 2020 to 4 ("very high") in 2021.

To what extent is each of the following issue areas a focus of your firm's SCS goals ?

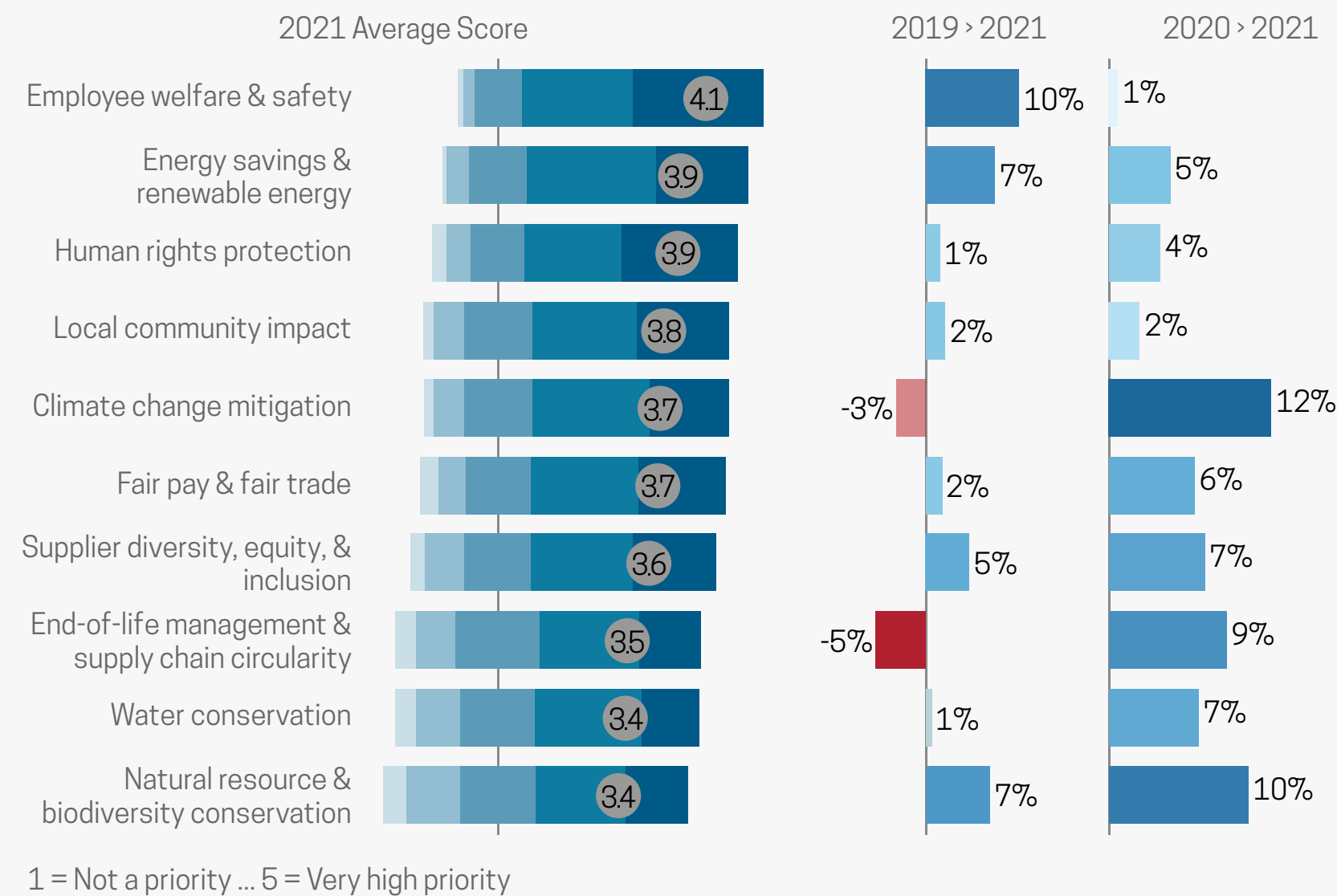


Figure 7: Goal change from 2019-2021 (n = 1,100)

Put Your Money Where Your Mouth Is: Supply Chain Sustainability Investments

We also investigated the potential gap between the respondents' assessments of their firms' supply chain sustainability goals and their assessments of their firms' investments to meet those goals.

Respondents were asked to assess their firms' investment in the same 10 sustainability dimensions using the same 1-5 Likert scale.

In Figure 8, we compare average responses along each dimension. It is, perhaps, not surprising, though disappointing all the same, that every

dimension shows goals ranked more highly than investment. And indeed, this has also been the case in prior years' reports. Actual investment is, after all, costlier than is goal-setting.

But we can also detect a subtler signal in Figure 8: The gap between goals and investment is higher on social dimensions than for environmental ones, another repeat from last year's report. However, we also see evidence of progress in closing the sustainability investment gap in recent years, particularly for human rights protection.

Difference in the average response for how the following issue areas are a focus of their firm's SCS goals compared to what extent it is a focus of their firm's SCS investment. A negative value indicates the score for goals is greater than investment.

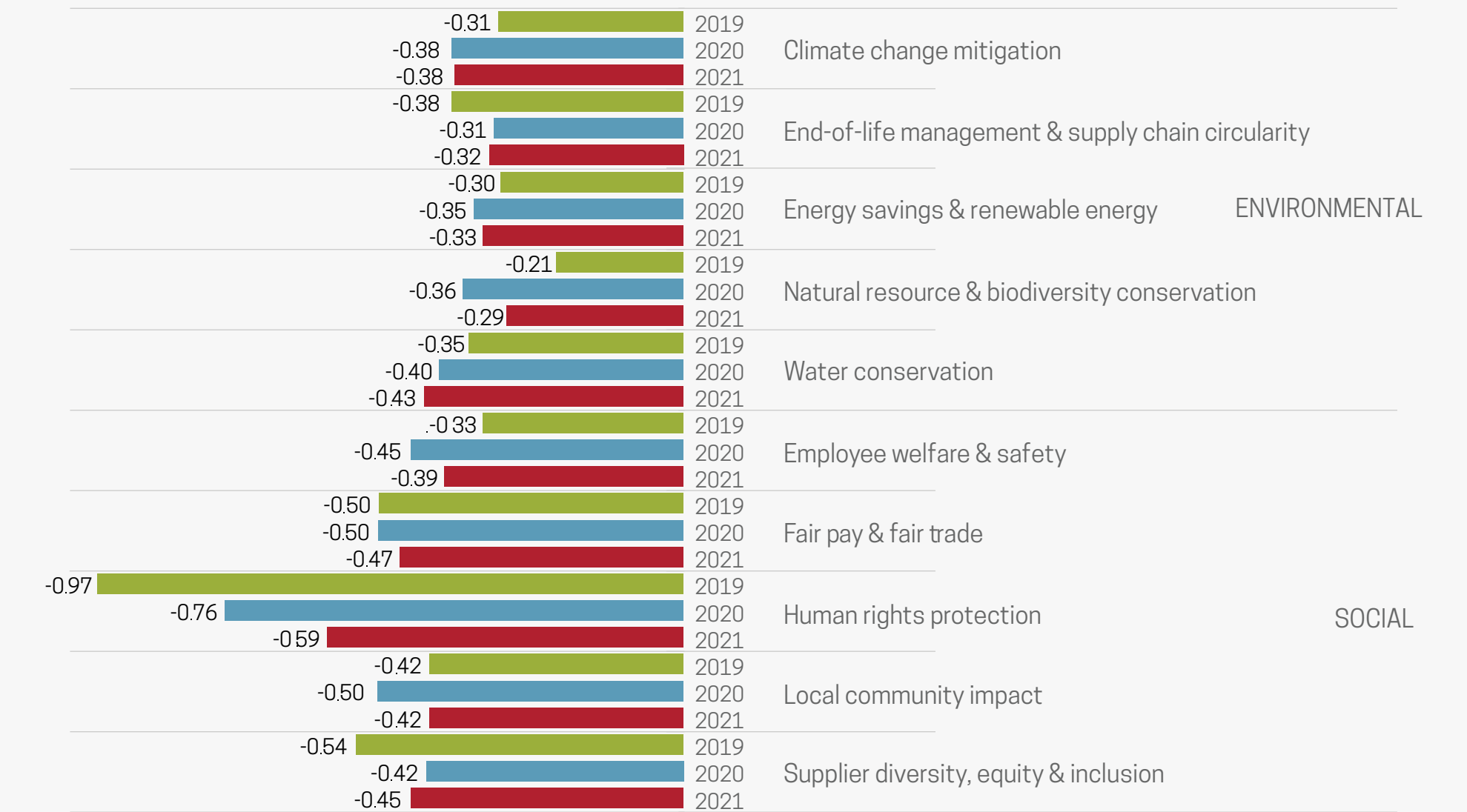


Figure 8: Gap between goals and investments (n = 2,187)

Changes Over Geography

Owing to both our new survey translations and a coordinated multilingual outreach effort, we were able to reach more of the world this year than ever before. Reaching more respondents from more countries afforded us enough responses from the regions of North America, Europe, Latin America & the Caribbean, Africa, and Asia to make viable statistical comparisons.

Globally, the comparison of firms' sustainability goals with their investments revealed a surprising and consistent geographical pattern. We compared the distribution of Likert scale responses from respondents representing firms headquartered in North America, Europe, Latin America & the Caribbean, Africa, and Asia for each of the 10 sustainability dimensions and each of the 10 pressure sources (see Appendix C). First, we looked for differences in responses from each of the five regions. We then compared regions against one another where global differences were observed. When global differences were detected, we tested again, but this time comparing the Global

North (broadly speaking, North America and Europe) to the Global South; (Latin America & the Caribbean, Africa, and most of Asia).* In terms of supply chain sustainability goals and investments, the Global North versus Global South aggregation was a frequently statistically significant grouping. Below, Figures 9–12 show where we saw differences between the Global North and Global South. Colored bars indicate statistically different distributions, while the blue, annotated lines indicates the average score for those dimensions in the Global North and South, respectively.

Figures 9 and 10 highlight where goals were significantly different across the the Global North and South. Respondents from firms headquartered in the Global North showed higher mean Likert scores among climate change, energy conservation, employee welfare and safety, and fair pay/fair trade, indicating a higher prioritization of these issues among firms headquartered in that part of the world.

* The traditional definition of the Global North and Global South is based on the Brandt Line, developed by West German Chancellor Willy Brandt in 1980. In this definition based on GDP per capita, the world is divided roughly along a latitude of 30° north. The wealthier Global North includes the United States and Canada, Europe, the former Soviet Union, Japan, Australia, and New Zealand. The comparatively more disadvantaged Global South includes Latin America, Africa, the Middle East, Asia minus Japan, and Oceania minus Australia and New Zealand.

This grouping has been used to highlight the very different standards of living and wealth between these two regions of the world. The terminology is similar to the global division between “developed” and “developing” countries or the “Third World”, though use of this terminology has been declining in favor of the Global North and Global South.

(For a more detailed explanation of this definition as well as the validity of the Brandt Line more than 40 years after it was first developed, see Nicholas Lees, “The Brandt Line after Forty Years: The More North–South Relations Change, the More They Stay the Same?,” *Review of International Studies* 47, no. 1 (January 2021): 85–106).

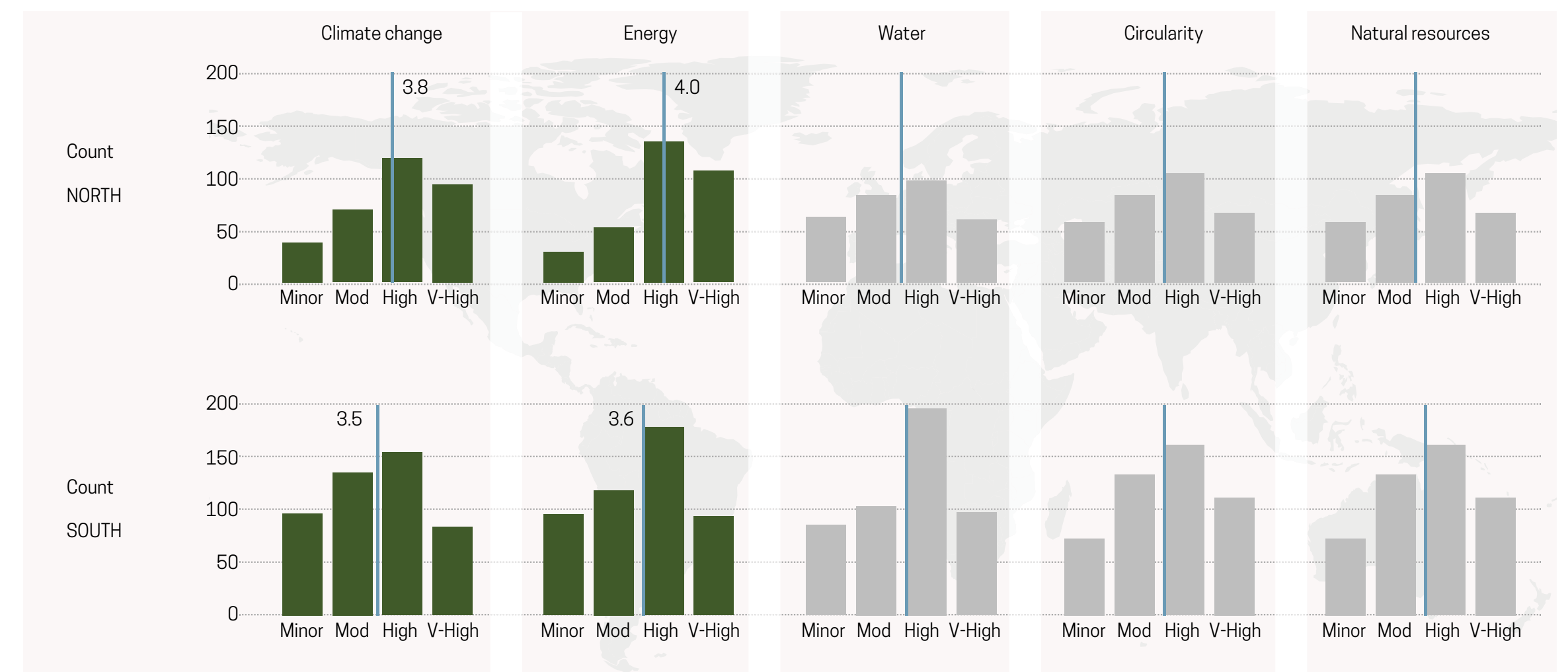


Figure 9: Environmental SCS goals in the Global North and Global South (n ≈ 800)

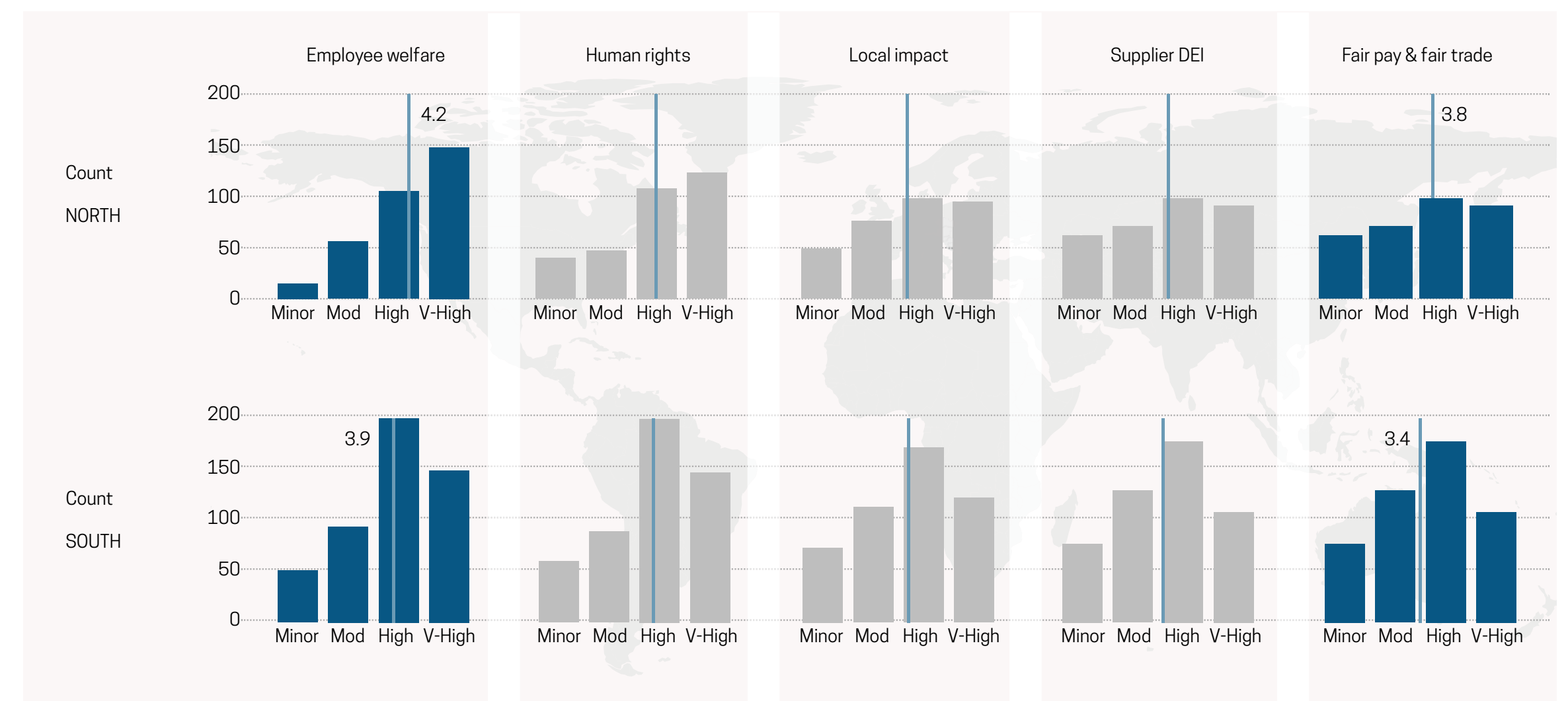


Figure 10: Social SCS goals in the Global North and Global South (n ≈ 800)

Figures 11 and 12 highlight where investments were different across the Global North and South, showing almost precisely the opposite pattern. In this case, the dimensions that were not significant when comparing goals *are* significant when comparing investment. These include water conservation, supply chain circularity, natural resource conservation, human rights protection, and supplier DEI. And in each of these cases, the mean score from respondents representing firms headquartered in the Global South is higher.

We can infer from our own data only a bit about what accounts for the differences discovered here. First, recall from Figure 4 that firm size is an important factor in commitment to supply chain sustainability, and average firm size tends to differ by region. For instance, 63% of Latin American respondents came from small firms. Notably, however, our responses from Asia and Africa show firm sizes more similar to those in Europe and North America, but goals and investments more aligned with those of Latin America & the Caribbean. Second, although we did not observe much difference in Latin American & Caribbean respondents' rankings of governmental pressure compared to the rest of the world (see Appendix C), our executive interviews did yield some insights. Said one Spanish-language interviewee, *“From the point of view of Latin American markets, consumers are less demanding than in other developed economies.”*

Other explanations are possible, but not traceable with our data. These possible explanations include (1) the relative supply chain positions (upstream versus downstream) of firms in the Global North compared to those in the Global South, (2) the legacy of international

development efforts that international relations scholars observe, similarly divides the world between the Global North and Global South along the Brandt Line; or (3) other hypotheses that we hope that our documentation of this phenomenon inspires.

Ultimately, the differences observed here seem to further support the motivating premise of this research: that supply chain sustainability means many different things to different people. In light of that, we would advise supply chain managers, who frequently work across international borders with both vendors and customers, to be aware of where local prioritizations and investments might differ from their own.

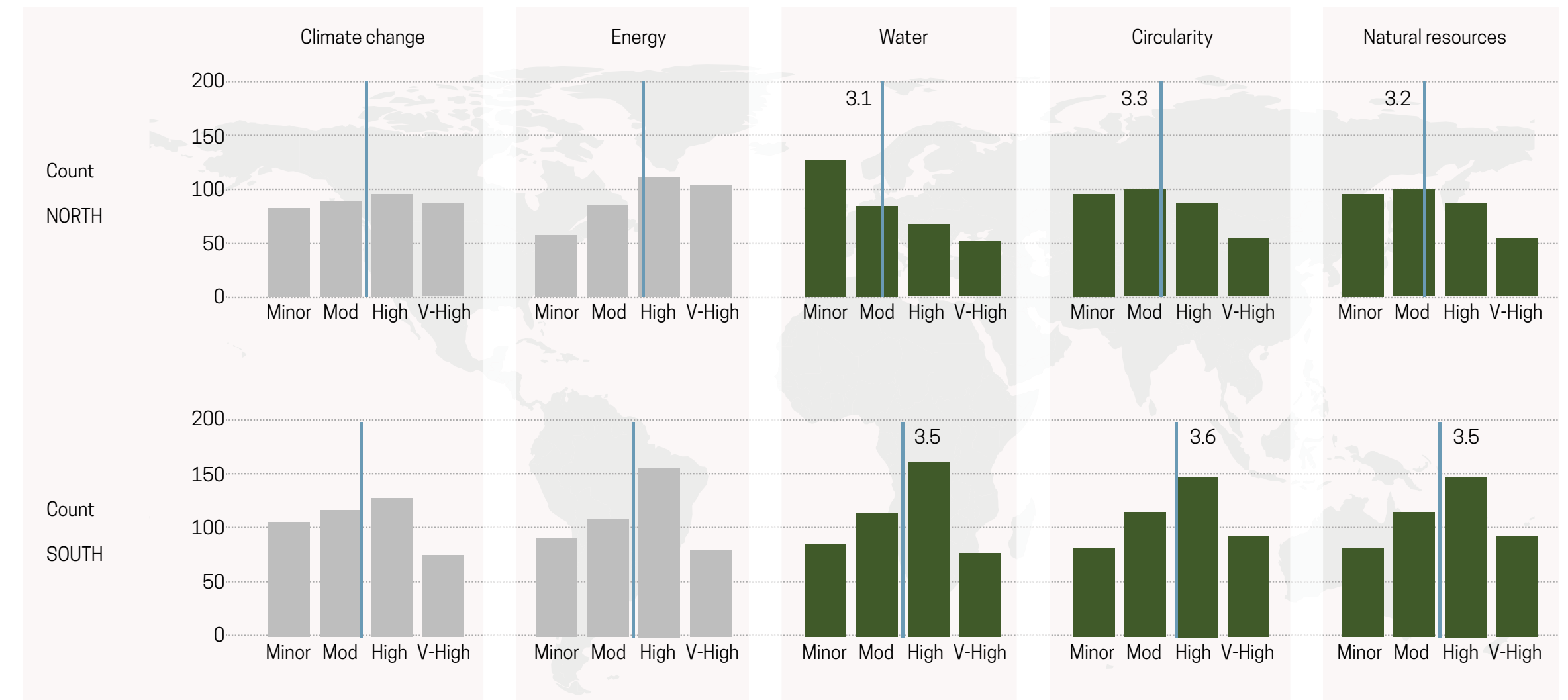


Figure 11: Environmental SCS investments in the Global North and Global South (n ≈ 800)

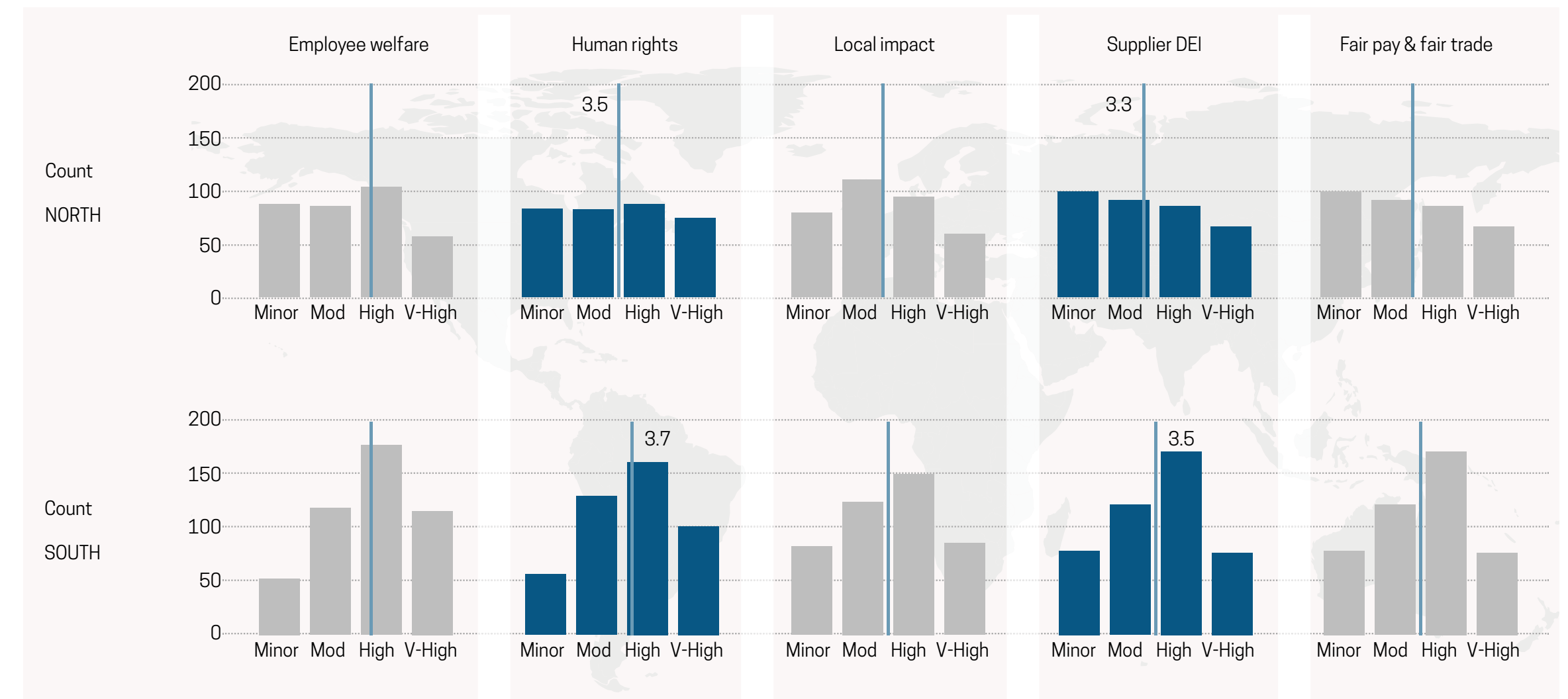


Figure 12: Social SCS investments in the Global North and Global South (n ≈ 800)

Changes in Technology

SCS Practices: A Staircase Emerges

Figure 13 can be seen as a “staircase” of supply chain sustainability practices in 2021. At the bottom of the staircase are the practices most commonly implemented, and at the top are those least so. In general, anyone looking to assess their next supply chain sustainability investment can look at which stair they find themselves on now to see what typically comes next—or which earlier steps their organization may have overlooked.

Interestingly, all paths lead upward and are mostly convergent. That is, supplier audit, supply

chain mapping, and codes of conduct (company and supplier) are the most prevalent practices: an SCS “base camp”. These practices also saw the greatest increase from 2020. Supplier collaboration, information technologies, and standards or certifications have been adopted by a smaller number of firms, owing perhaps to their comparative cost or lack of familiarity, but this represents a “first ascent”, where the firm that has already reached its “base” can aspire to go to next. At the top of the staircase are the most rarely applied practices among our respondents, including supplier training, third-party verification, carbon offsets, and NGO/third-party collaboration. This “peak” includes initiatives and technologies that most firms as yet consider aspirational or those only on the radar of firms that are particularly aggressive about their supply chain sustainability efforts.

We see our clients moving towards practices that will improve transparency—notably supply chain mapping and codes of conduct. There is a strong desire to contribute to ESG values, and it goes beyond technology. We believe you have to incentivize the entire supply chain ecosystem to be transparent and open.

—Rob Barrett
Principal, US Supply Chain Advisory, KPMG LLP

Supply chain management has never held a more critical and influential role in the world than it does today, and organizations are rising to the challenge. To mitigate ongoing supply chain disruptions, the leaders in the space are becoming more conscientious and intentional in their supply chain monitoring. As a result, we’re not only seeing a rise in sustainability tracking, but also, a push for evaluating all risks, including ESG, safety, business risk and much more, in one centralized location for greater transparency.

—Danny Shields
Vice President for Sustainability & Risk, Avetta

Which of the following practices does your firm have in place to manage supply chain sustainability?

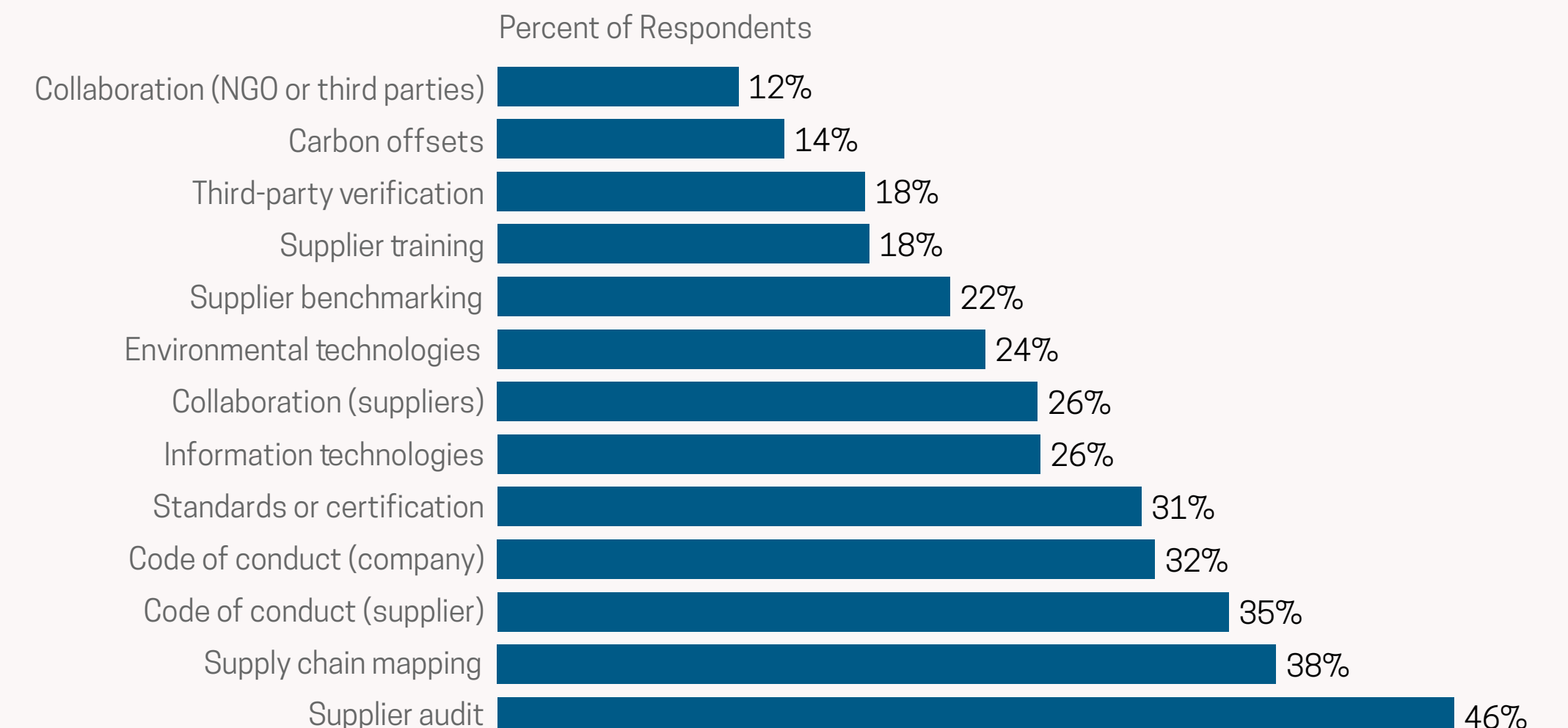


Figure 13: “Staircase” of SCS practices (n = 2,044)

SCS Disclosures: A Steeper Summit

Our survey also asks respondents about their firms' practices for disclosing supply chain sustainability information. Arranged again as a staircase, we see that firms most commonly communicate their sustainability efforts through their own websites, press releases, and corporate CSR reports. These are all, of course, channels of in-house messaging. That is, the company itself both collects the data and reports it. Less often applied are the use of reporting organizations and third-party case studies. These peak stairs require partnerships with specialists and watchdog groups, often requiring added cost and external collaboration. Although they appear less frequently, these kinds of partnerships also represent the most meaningful increase year over year after falling from 2019 to 2020.

In addition to illuminating a possible next step in one's supply chain sustainability journey, the staircases of practice and disclosure also point towards boundary crossing partnerships as a next frontier in supply chain sustainability. The higher steps are ones that come with more difficult or unpalatable requirements like collaboration with outside entities, and perhaps even sharing sensitive information with those external collaborators and stakeholders. This, however, is not always easy; through our executive interviews, we learned that this is a real barrier to improving supply chain sustainability. One respondent from the warehousing and logistics sector reflected on this challenge: *"The collaboration has to be both inside your company and outside, across industry, and that's really hard to do, particularly because you have to have a really good culture to do that."*

Does your firm disclose information about its supply chain sustainability practices using each of the following channels?



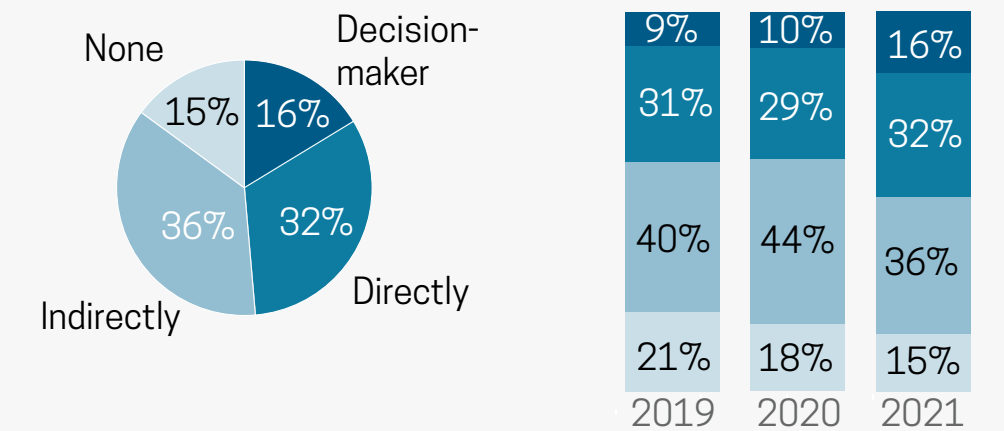
Figure 14: "Staircase" of SCS disclosures (n = 382)

Increasing Involvement Across Business Functions

We also asked survey respondents about their level of engagement with supply chain sustainability initiatives. Respondents could report themselves as decision-makers, directly engaged, indirectly engaged, or not at all engaged with supply chain sustainability. In every year since 2019, the respondents reported most commonly that they were indirectly engaged. With the current survey, however, we saw an increase in responses from decision-makers and those directly engaged with SCS initiatives. We also saw a slight decrease in those not involved at all over the three years.

The increase in all levels of engagement—especially the large and growing representation of direct engagement—indicate sustainability awareness and agency spreading throughout firms, beyond the purview of a single "sustainability czar", and into day-to-day operations.

What best describes your engagement with your firm's sustainability efforts in the supply chain?



Comparison by firm size

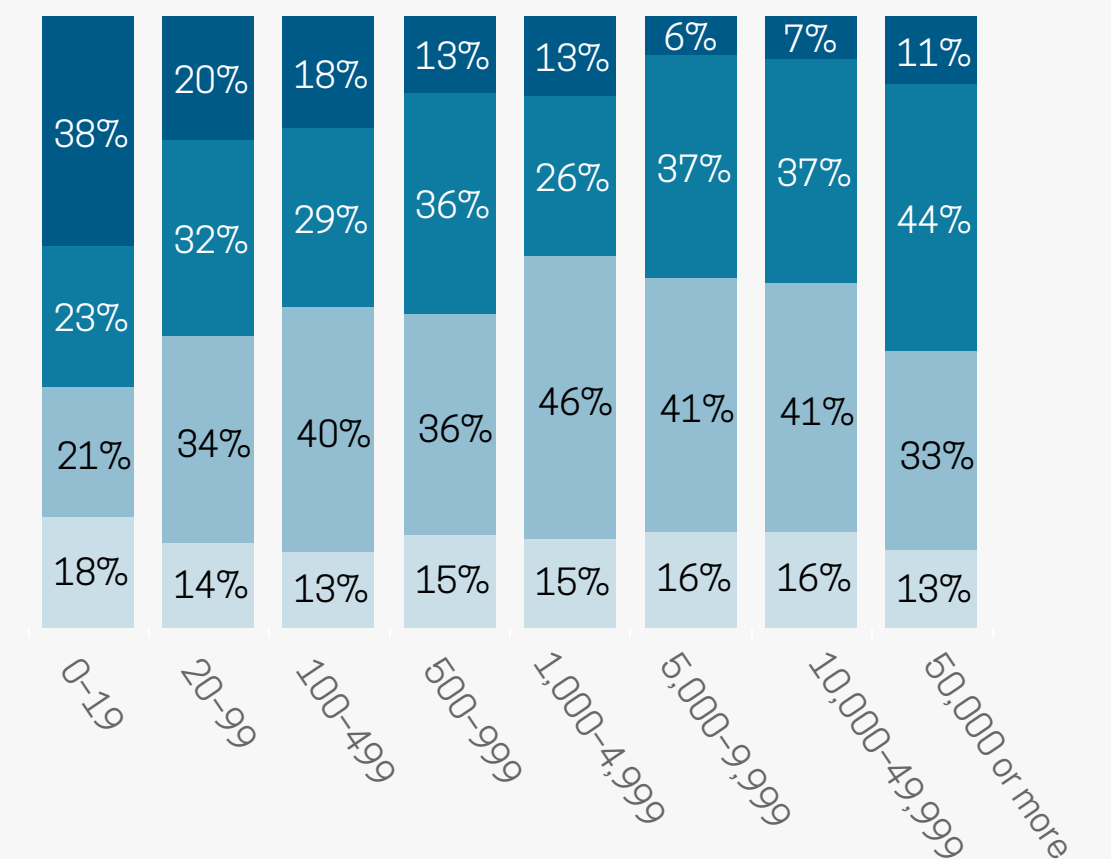


Figure 15: Respondents by level of engagement with their firms' SCS efforts (n = 1,522)

Supply chains are so complex that no one can tackle sustainability alone. Collaborating with the right partners who have the right technology is essential.

—Rachel Schwalbach
Vice President for
Environmental, Social, & Governance, C.H. Robinson

Implications of the State of Supply Chain Sustainability 2022

Out of the Covid-19 Crisis Came Opportunity

For the second year in a row, we observed that roughly 80% of respondents reported that the global pandemic did not slow their firms' supply chain sustainability efforts. This surprising result left us puzzled until we explored it more deeply this year. It turns out that the supply chain crises triggered by the global pandemic actually brought new scrutiny, but with it also new resources and opportunities. As one executive told us, the pandemic provided "air cover" to take on projects that otherwise might not have been possible. Many firms utilized the opportunity presented by the crisis to make bold moves to improve their firm's supply chain sustainability to, if nothing else, mitigate risk of disruption and improve their supply chain resilience.

A Steadily Increasing Heat with Occasional Flare-Ups

Every dimension of supply chain sustainability that we studied has shown an increase over the three-year period of observation. That data point alone speaks to the urgency of these issues. But, perhaps, more surprisingly, the heat ebbs and flows with time. In this case, the surge in commitment to social issues that we saw in 2020 plateaued, and environmental issues, which slowed down in 2020, came back strong in 2021.

The resurgence of interest in environmental SCS dimensions in this year's data implies that firms whose focus in recent years was on social issues should take a longer view to the re-emerging focus worldwide on water conservation, natural resource conservation,

and climate change mitigation. Importantly, supply chain sustainability itself does not appear to be a zero-sum competition between environmental and social issues. Rather, pressure on dimensions in both categories appears to be rising, with rates of acceleration periodically fluctuating between the two. The aphorism "A rising tide lifts all boats" is popularly attributed to John F. Kennedy in the context of economic policy. However, the same may apply to SCS priorities as well. In the three years of this study, we have only seen a rise in the aggregate pressure on firms to improve their supply chain sustainability, and we see no reason why this would decrease anytime in the near future.

Change Is the Only Constant

We observed that how firms prioritize different components of supply chain sustainability has changed over time and differs by geographic location—most markedly between the Global North and the Global South. We've also observed that the tools firms use to improve supply chain sustainability are evolving.

While it is possible to infer what causes different dimensions of supply chain sustainability to rise and fall in importance, this is perhaps of lesser managerial relevance than simply to know that it happens—and to put that state of constant flux on management's radar. Unidimensional visions of supply chain sustainability investments that seem right to founders, or right for the customer base at a particular moment in time, do not seem long for this world based on what we have observed in three years of this study. Instead, our results suggest that firms must be ready to adapt their sustainability efforts to their contexts.

This implies that firms should be aware that as sustainability priorities change over time, their SCS efforts or profiles that attract and win business may not do so every year—even with the same customers. The data we've collected shows clear evidence of change over time in how firms prioritize the different dimensions of sustainability, especially in international contexts. Therefore, supply chain managers working with overseas vendors and customers would be wise to keep in mind the different prioritizations of SCS dimensions we see across various regions as they forge and maintain those relationships.

The mercurial nature of the hierarchy of SCS priorities, however, is underscored by the magnitude of the danger we face from not addressing or ignoring our sustainability challenges. That is, the effort to make our supply chains more sustainable may take place on different "fronts", of which any or all may intensify or abate over time, but the gravity of the danger we face by neglecting sustainability on *any* front is immense and omnipresent. Thus, firms that fail to pivot accordingly do so at their own peril; they risk losing not only their competitive advantage, but they also contribute to a much larger and existential risk for our shared planet.

Appendices

A. Contributors

This project is made possible by the generous efforts of a large group of dedicated contributors and collaborators.

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B. Translation and Reliability

This year, we simultaneously released our online survey instrument in English, Spanish and Simplified Mandarin Chinese translations. Translations of the English language survey to the two other languages were performed by translation teams. The Spanish language translation team consisted of Daniela Muñoz (Mexico), Arianne Mahuad (Peru) and Anderson Bernal (Colombia). The Mandarin translation team consisted of Jay Guo and Daniel Gao from the Ningbo China Center for Supply Chain Innovation (NISCI) in Ningbo, China, part of the MIT Global Supply Chain and Logistics Excellence (SCALE) Network.

After developing each translation, the MIT CTL research team talked through each translated question with the translation teams, stating and restating the translated words in order to ensure that the correct meaning was captured. Where potential discrepancies were encountered, native speakers were recruited to share their insights and offer suggestions.

Once the survey data was collected, we performed another indirect test of translation accuracy. We used a Cronbach's alpha test to assess the internal consistency all the responses across translations, as well as within each of the three translations independently. Cronbach's alpha is a test of a measurement scale's internal consistency. That is, it tests whether answers show sufficient inter-item correlation to indicate that the tested questions are all measuring respondents' feelings about the same concept, or domain. Cronbach's alpha is measured on a scale of 0 to 1, and, generally speaking, scores exceeding 0.60 indicate that the survey instrument is 'reliable'. The results for all the questions, as well as the three translations are shown below.⁶

Table 1: Reliability results for survey translations

| Language | Items | Sample units | Chronbach's Alpha coefficient |
|-------------|-------|--------------|-------------------------------|
| 3 Languages | 108 | 2,932 | 0.656 |
| Chinese | 108 | 128 | 0.837 |
| English | 108 | 1,564 | 0.716 |
| Spanish | 108 | 976 | 0.684 |

C. Results of Global Comparisons

Comparisons across regions were statistically tested using a chi-squared distribution test with Bonferonni correction. This method tests whether the groups of responses are dissimilar enough to conclude that they must have been drawn from meaningfully different populations. This is a probabilistic test that is commonly employed to compare responses to ordinal survey data like ours. We first tested entire data sets to see where some difference was observed. We then looked for differences in groups, across the Global North–South divide—and to confirm that the effect of this grouping was not just a result of aggregating, we also tested along an East–West divide. The results of those tests are shown in the tables below.

Table 2: Results of regional comparisons of SCS pressure sources/influences, goals, and investments

| | Global comparison | | North–South comparison | |
|-----------------------------------|-------------------|----------------|------------------------|----------------|
| | x ² | p [†] | x ² | p [†] |
| Pressure sources | | | | |
| 1: End consumers | 15.1 | 0.23 | — | — |
| 2: Corporate buyers | 16.5 | 0.17 | — | — |
| 3: Investors | 12.16 | 0.43 | — | — |
| 4: Current and future employees | 25.9 | 0.011 | — | — |
| 5: Company executives | 14.1 | 0.29 | — | — |
| 6: NGOs and third parties | 7.2 | 0.84 | — | — |
| 7: Industry associations | 23.14 | 0.007 | — | — |
| 8: Governments | 21.47 | 0.044 | — | — |
| 9: Mass media | 16.18 | 0.18 | — | — |
| 10: Local communities* | 41.65 | <0.001 | 15.1 | 0.002 |
| Goals | | | | |
| 1: Climate change mitigation* | 47.5 | <.001 | 24 | <.001 |
| 2: Energy conservation* | 73.7 | <.001 | 36.4 | <.001 |
| 3: Water conservation | 14.3 | 0.28 | — | — |
| 4: Supply chain circularity | 11.9 | 0.45 | — | — |
| 5: Natural resource conservation | 24.4 | 0.02 | — | — |
| 6: Employee welfare* | 32.7 | 0.001 | 25.8 | <.001 |
| 7: Human rights protection | 21.8 | 0.04 | — | — |
| 8: Local community impact | 13.2 | 0.36 | — | — |
| 9: Supplier DEI | 19.7 | 0.07 | — | — |
| 10: Fair pay/fair trade* | 43.3 | <.001 | 18.4 | <.001 |
| Investments | | | | |
| 1: Climate change mitigation | 24.5 | 0.02 | — | — |
| 2: Energy conservation | 24.7 | 0.02 | — | — |
| 3: Water conservation* | 52.8 | <.001 | 42.4 | <.001 |
| 4: Supply chain circularity* | 37.3 | <.001 | 15.1 | 0.002 |
| 5: Natural resource conservation* | 42.9 | <.001 | 31.7 | <.001 |
| 6: Employee welfare | 10.6 | 0.56 | — | — |
| 7: Human rights protection* | 41.3 | <.001 | 23.23 | <.001 |
| 8: Local community impact | 22.5 | 0.03 | — | — |
| 9: Supplier DEI* | 31.58 | 0.002 | 22.46 | <0.001 |
| 10: Fair pay/fair trade | 13.8 | 0.31 | — | — |

* Indicates statistical significance

All comparisons evaluated at threshold $\alpha = 0.05$

With Bonferroni correction, global significance threshold < 0.0025, Global North–South threshold < 0.006

† Counts for question scores 1 and 2 were combined to avoid any item showing a count of less than 5, which can compromise the validity of chi-squared tests. For a full discussion of this methodology, see Harvey Russell Bernard, *Social Research Methods: Qualitative and Quantitative Approaches* (Thousand Oaks, Calif.: Sage, 2000), 563–67.

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