SCOPE 3 EMISSIONS INVENTORY AND SUPPLIER ENGAGEMENT FOR STEELCASE, INC.

by

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Executive Summary

As a leader in corporate sustainability, Steelcase, Inc., a multinational $3.7B office furniture company, is committed to reducing its carbon footprint by setting science-based targets aligned with a 1.5ºC climate scenario as set forth by the Paris Agreement. As such, the objectives of this Master's Project included the development of a scope 3 greenhouse gas emissions inventory, a set of strategic communications for internal and external stakeholders, and a supplier engagement strategy, each in support of Steelcase setting and achieving a set of scope 3 science-based targets for the decade ahead.

Given the distribution of emissions across scope 3 categories, the team focused on three of the most emissions-intensive and thus impactful categories: purchased goods and services (PGS), upstream transportation and distribution (T&D), and waste generated in operations (WGO). For PGS, the team leveraged life cycle assessments for a number of products combined with spend-based emissions factors to estimate emissions for Steelcase's supplier base. For T&D emissions, the team again used spend-based emissions methods, but included distance and travel type data to calculate a more fine-tuned emissions inventory for T&D suppliers. For WGO, the team calculated scrapped and discarded tonnage amounts from internal sources to determine overall waste, then used emissions factors to determine the equivalent embedded emissions for each material type. Steelcase then used this inventory to launch an ambitious set of climate goals for the next decade: with an overarching goal to achieve carbon negative emissions across operations by 2030, Steelcase also set targets to reduce scope 1 and 2 emissions by 50% by 2030, reduce scope 3 emissions associated with WGO and business travel by 14% each by 2030, and engage with 80% of suppliers by emissions to set their own science-based targets by 2025.

To accompany the launch of that set of targets, the team developed a set of strategic communications for both internal and external stakeholders. Then, the team began developing and producing a six-part webinar series to educate and engage Steelcase's suppliers to develop their own emissions inventories and science-based targets. As Steelcase works towards these goals and continues to establish itself as a leader in corporate sustainability, the team has developed the following recommendations:

- Build on improvements in data management practices by further transitioning from spend-based to supplier-specific methods and developing supportive processes
- Balance the trade-offs between increasing granularity of data with the associated costs
- Bolster the scrap tracking initiative and implement strategies to minimize waste-to-landfill
- Facilitate understanding and engagement across the organization
- Expand supplier engagement infrastructure beyond the webinar series
- Support policies and initiatives that decarbonize manufacturing and transportation

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Disclaimer

Any opinions expressed in this report represent a consensus of the authors and do not represent the positions or policies of Steelcase or of the University of Michigan.

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Introduction

Steelcase Inc. is a multinational corporation that manufactures a wide assortment of furniture and space solutions for office, healthcare, and educational environments. Founded in 1912 and headquartered in Grand Rapids, Michigan, Steelcase manages operations across the globe with an annual revenue for FY20 reaching $3.7 billion.[1] Over its more than 100 years in business, Steelcase has acquired several brands including Coalesse, Designtex, AMQ, and others, and became a publicly traded company in 1998.

With a sustainability vision that strives for lasting value for customers, employees, shareholders, partners, communities, and the environment, Steelcase believes that "business should be a force for good" and has demonstrated this commitment by designing products for circularity, promoting transparency with corporate reporting and product declarations, and increasing energy efficiency to minimize its environmental and social impact.[2] As part of that vision, Steelcase's comprehensive sustainability strategy includes a commitment to identifying and quantifying the risks of climate change on its business. By measuring scope 1 and scope 2 greenhouse gas (GHG) emissions (i.e., direct emissions from owned or controlled generation and indirect emissions from purchased electricity, respectively), Steelcase has achieved a 32% energy and emissions reduction since 2010, surpassing the original goal of a 25% reduction by 2020.[3]

To advance its leadership on corporate sustainability impact, Steelcase committed to setting science-based targets for additional emissions reductions, defined as targets that are in line with what the latest climate science deems necessary to meet the goals of the Paris Agreement – limiting global warming to well-below 2°C above pre-industrial levels and pursuing efforts to limit warming to 1.5°C. Integral to the process of setting science-based targets is setting a scope 3 target, which encompasses all indirect emissions upstream and downstream in the value chain and often represents the large majority of a company's emissions.[4] According to the standards set by the Science Based Targets initiative (SBTi) (see Appendix A for an introduction to SBTi and other entities that provide frameworks for these activities), a scope 3 target is required when they account for 40% or more of a company's total scope 1, 2, and 3 emissions. Steelcase estimated that scope 3 emissions accounted for 82% of its total emissions in 2018. The SBTi further requires that the scope 3 target boundary collectively covers at least two-thirds of total scope 3 emissions. Accordingly, of the 15 categories of scope 3 emissions established in the GHG Protocol's Scope 3 Standard, shown in Figure 1, Steelcase identified three of the most material and relevant: purchased goods and services, upstream transportation and distribution, and waste generated in operations, around which this Masters Project was focused. Detailed descriptions of these categories can be found in Appendix B.

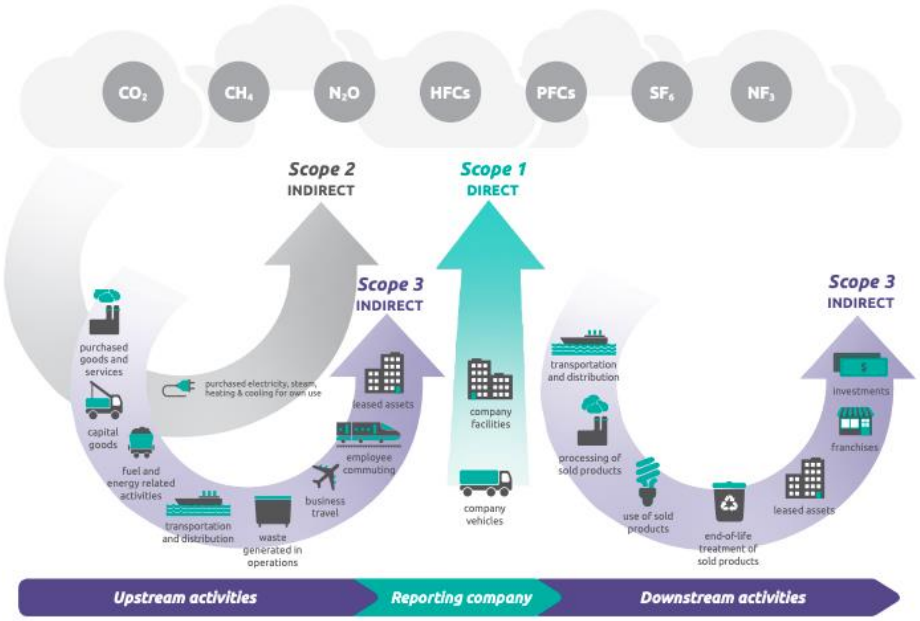

Figure 1: Overview of GHG Protocol scopes of emissions across the value chain.[5]

Project Scope

The scope of this Master's Project with Steelcase included calculating baseline emissions inventories for each of the three selected scope 3 emissions categories in support of setting science-based targets, communicating with internal and external stakeholders during the launch of those targets, and engaging Steelcase suppliers to inventory their emissions and set their own science-based targets.

The project was considered especially high-priority by Steelcase leadership as the company continues to expand product lines, grow its customer base, and promote responsible business practices. With this in mind, Steelcase aims to be a first-mover in its industry by addressing key issues of sustainability in manufacturing and business. This project was intended to advance Steelcase's overall sustainability and carbon reduction strategy in order to further secure a competitive edge in the industry, to respond to increasingly environmentally conscious consumers and investors, to preempt future policy requirements, to decrease operational risks, to increase transparent strategic and financial planning, and ultimately, to demonstrate business as a force for good.

Methods and Results

Inventory

Purchased goods and services

As a leading global manufacturer of office, healthcare, and educational environments, Steelcase's supply chain is the necessary foundation of its business. Using a screening tool and a limited amount of supplier-specific data, Steelcase initially estimated that purchased goods and services accounted for 69% of its total scope 3 emissions in 2018. This category includes all upstream emissions from the production of products purchased or acquired by Steelcase in a given reporting year, where products include direct materials, vended finished goods, and services.[6] In the context of this inventory effort, the team looked primarily at direct materials and vended finished goods, as services were determined to be a minimal portion of the category's emissions, and referred to this category's emissions as "supplier emissions." As the SBTi requires a company's scope 3 target boundary to collectively cover at least two-thirds of total scope 3 emissions, this category's inclusion was required to achieve SBTi target validation.

Given that most companies have little direct control over or visibility to the emissions of its suppliers, it is common to use one of several methods to derive emissions factors with which to estimate these emissions for reporting and target-setting purposes. Though Steelcase had some supplier-specific primary data from a limited number of product life cycle assessments (LCAs), the team relied upon secondary data sources to estimate remaining supplier emissions; namely, a hybrid approach using industry average emissions factors for both an average-data method and a spend-based method. These methods produce broad averages compared to a supplier-specific method, but represent a significant time and cost savings given the comprehensiveness and relative simplicity of the approaches. Even with a supplier-specific method, the accuracy of the resulting emissions data may not be superior as the data quality is ultimately dependent on the granularity of the emissions data received, the reliability of the suppliers' data sources, and the allocation techniques used.[7]

First, a number of product LCAs previously conducted by Steelcase provided key material data that could be used to apply the average-data method in which industry average emissions factors are applied to the relevant unit of goods or services; for these purposes, that unit was mass of materials. The team used SimaPro (a tool used in the development of LCAs) - with a set of ecoinvents libraries and the TRACI 2.1 method - to disaggregate individual materials within the original LCAs and derive emission factors by individual material (e.g., kg CO2e per kg of granulate polypropylene). Then, those emissions factors were applied to the cumulative mass of each material purchased in 2019 and reaggregated at the supplier level. This analysis produced a set of high-impact suppliers to be included in the reporting and target-setting boundary: 11 suppliers in the seating category from the North America (NA) region and six suppliers in the desking category from the Europe, the Middle East, and Africa (EMEA) region, cumulatively representing 70% of supplier emissions.

To estimate supplier emissions *not* represented by existing LCAs in the seating and desking categories in NA and EMEA, the team used a spend-based method via an environmentally-extended input-output (EEIO) analysis. EEIO models can be used to estimate GHG emissions resulting from the production and upstream supply chain activities of different sectors and products

in an economy. The output of EEIO models is typically a quantity of GHGs emitted per unit of revenue in a particular industry sector (e.g., kg CO_2e/$ in the flat glass manufacturing sector), which can then be applied to a company's relevant financial data (e.g., dollars spent on flat glass). To initiate the spend-based process for supplier emissions at Steelcase, the team obtained a complete list of Steelcase's total spend by supplier, totaling nearly 500 companies, and sorted it in order of decreasing total spend. Given a long tail on the distribution, the team evaluated the top 100 by spend, representing about 90% of total spend.[8] Then, the procurement team provided an additional layer of insight regarding strength of relationship and likelihood of setting science-based targets, narrowing the list further yet.

Using internal insight and additional web research, the relevant scope of business was captured for each of the selected suppliers. Then, that scope of business was further categorized into one of 429 sectors[9] in a United States national input-output table (from 2015, the most recent data year available) from the Eora global supply chain database.[10] Of the available environmental satellite accounts in this table, the team selected "Total emissions of Kyoto GHGs excluding LULUCF CO2-e (Gg)" (where LULUCF is "land use, land-use change and forestry") and used MATLAB to produce emissions factors for each sector in the form of Gg/$. These emissions factors were then applied to the total spend for each supplier to estimate total emissions across the selected supplier base, identifying a set of 21 additional suppliers to include in the boundary for reporting and target-setting, representing another 14% of supplier emissions.

The resulting emissions inventory ultimately enabled Steelcase to identify a set of suppliers around which to draw the target boundary, ensuring the inclusion of those which contributed the largest share of emissions to Steelcase's footprint and with which the procurement team maintained strong relationships. Given the lack of direct control over supplier emissions and the partial dependence on spend-based calculations, Steelcase opted to set a supplier engagement target rather than an absolute or intensity reduction target for purchased goods and services emissions. The SBTi criteria for this type of target require: a boundary set around relevant categories, visibility to the percentage of emissions covered by that boundary, a maximum time frame of five years from validation submission for target fulfillment, and supplier targets that are in line with SBTi resources (though formal SBTi validation is not required).[11] Steelcase set its supplier engagement target accordingly, committing that its in-boundary PGS suppliers, representing 59% of scope 3 emissions, will set science-based targets by 2025.

Upstream transportation and distribution

With a global manufacturing and distribution network, transportation and distribution activities represent a critical component of Steelcase's value chain and thus represent a significant and material portion of its scope 3 footprint. Previously, Steelcase estimated upstream transportation and distribution (T&D) emissions with a simplified spend-based method that provided emissions factors by dollar spent on a general transportation type (i.e., land, sea, air), then aggregated by

supplier. The team improved the specificity and accuracy of this estimate using a hybrid approach of the average-data and spend-based methods.

For all of the T&D suppliers for which Steelcase had primary data on distances, routes, vehicle types, and country of origin, WRI[12] and EPA[13] emissions factors were applied to the total mileage per T&D type (e.g., kg CO_2e/mile of rail travel), and then aggregated at the supplier level. This approach provided a more accurate representation of total emissions per supplier and per T&D type within each supplier. When there was no mileage or route data, the EEIO spend-based method (as described above in PGS) was used to estimate the remaining emissions, representing a more granular spend-based approach than previously used for this category, and thus an improvement nonetheless.

Upon the application of these methods to all T&D supplier data, T&D accounted for 8% of all scope 3 emissions, representing the second most emissions-intensive scope 3 category for Steelcase alongside capital goods. Given the 64% of scope 3 emissions already covered by the in-boundary emissions from PGS, waste generated in operations (to be described below), and business travel (not in scope of this project), it was determined that Steelcase would need to include roughly 40% of the T&D supplier base in the target boundary to achieve the two-thirds SBTi requirement. Given the consolidated nature of the T&D supplier base, this meant addressing nine of its largest providers by spend.

The resulting inventory enabled visibility to a more accurate baseline from which Steelcase was working and allowed for a more targeted approach to identifying the 40% of in-boundary suppliers required for the target. Moreover, the team identified land freight as a clear target for emissions reduction efforts as it accounted for nearly 85% of all T&D emissions globally. Further, the analysis showed that NA and EMEA regions comprised about 83% of T&D emissions. Ultimately, this T&D inventory enabled Steelcase to identify a targeted list of suppliers to engage for emissions reduction efforts under the supplier engagement target.

Waste generated in operations

Steelcase has demonstrated its commitment to waste reduction by focusing on materials chemistry, life cycle assessments, and recycle-reuse options to divert materials sent to landfill. The company introduced alternatives to end-of-use strategies such as their novel Eco-lease purchasing program which allowed customers to return products to Steelcase after a predetermined lease which were then remarketed adopting a sustainable cradle-to-cradle method. With the successful implementation of this initiative and others, the company has been recognized by the Environmental Protection Agency (EPA) establishing them as a leader in waste management within the industry for over a decade.[14] More recently, Steelcase acknowledged its 25% waste and water use reduction goal by the year 2020 and reported that they have so far reached 21% reduction in hazardous and landfill waste in the 2018 Corporate Sustainability Report.[15]

Steelcase has annual waste reports summarizing its waste data from each manufacturing plant dating back to 2010, providing detailed insights into the waste generation processes. However, no analysis existed regarding the carbon intensity of each commodity or waste stream. Since this was crucial to calculate Steelcase's scope 3 baseline inventory and emissions reduction efforts, the team performed this analysis.

This analysis was conducted primarily in spreadsheet format and used the amount of waste generated per commodity and its respective waste stream (i.e., recycling, compost, landfill) to apply an emissions factor obtained from a literature review. These emissions factors (e.g., metric tons of CO_2e per metric ton of waste material) were derived from a series of partial LCAs in line with ISO 14064 standards and quantified the impact of source-segregated recycling and end-of-life management materials.[16] Some material categories were too specific to the manufacturing processes and products of Steelcase (e.g., foam, mixed plastics) and had no existing emissions factors in the literature. For these commodities, an average emissions factor calculated from all the waste categories was applied. Upon completion, this analysis showed that waste generated in operations contributed 3% to the overall scope 3 baseline emissions inventory for FY20.

To align with climate science and limit global warming by 2ºC, Steelcase committed to at least a 13.5% emissions reductions target from FY20 for waste generated in operations. Before deciding the final goal, the Operations team wanted to determine the feasibility of various targets by translating emissions reductions targets into the amount of waste generated in tons. Four different emissions reductions scenarios were calculated: 9%, 15%, 20%, 25%. Each of these scenarios utilized the average emissions factor for all of the Steelcase commodities to determine an estimate of the reduction by volume that would be needed to achieve this target. After close consideration of the scenario analysis, the 15% emissions reduction scenario translated to just over a 20% reduction by volume for waste generated – a bold target for a relatively short timeline of ten years. Thus, a 14% emissions reduction was chosen as the final target.

In order to promote efficient packaging and manufacturing, the team also conducted industry benchmarking and research on automotive companies in Michigan that demonstrated a commitment to zero-waste initiatives over the last two decades such as GM, Subaru, and Ford. With this research, multiple strategies for both circularity and business development were identified that Steelcase can adopt and share with their global suppliers to achieve their own waste reduction goals.

Launch of carbon strategy

Following the completion of the scope 3 inventory work described above and the validation of the respective science-based targets, Steelcase launched the next iteration of its carbon strategy in August 2020 by announcing the company's status as carbon neutral across its operations and committing to be carbon negative by 2030 through both absolute reduction of operational emissions and financing carbon offset initiatives.[17] Steelcase committed to reducing its scope 1

and 2 emissions by 50% by 2030 and addressed its scope 3 emissions, as mentioned above, by pledging to cut indirect emissions from both business travel and waste generated in operations by 14% and to engage two-thirds of its supply chain (PGS and T&D) to set their own science-based targets by 2025.[18] The baseline for these goals was FY20, which is March 2019 through February 2020 for Steelcase.

Communication

Preceding the August 2020 launch of the scope 3 targets as part of the larger carbon strategy announcement, the team developed a set of communications guides to support both internal and external stakeholders in understanding these targets. Specifically, the team created internal briefs for Marketing and Sales, Operations, Procurement, and all employees, tailoring the message to each group's respective priorities and expected roles. These documents were shared on the Steelcase intranet. Though the official press release for the launch was written by Steelcase's PR partner, the team also reviewed and provided feedback on the document.

Supplier Engagement

Given the importance of addressing scope 3 emissions, Steelcase chose to engage with PGS and T&D suppliers to set their own science-based target over the next five years, as described above. In order to achieve this supplier engagement target, Steelcase knew that it would need to develop a creative and dynamic approach. Thus, the company decided to host a six-part webinar series open to all suppliers to initiate long term partnerships and knowledge exchanges. This series intended to both increase awareness and reduce emissions across the value chain by providing suppliers with the expertise and resources that Steelcase accumulated over the years. This initiative also provided a way to maintain consistent communication and direct visibility to suppliers, so that smaller, lesser equipped companies felt supported and empowered to set science-based targets and reduce their carbon footprint.

The webinar series was designed to be delivered every alternate month, to be recorded and shared for future viewing, and to walk suppliers through a logical knowledge-building process. In addition to providing educational materials, the team used live polling questions to cultivate real-time engagement and promote retention of information. This also enabled the team to gauge supplier sentiments, motivations, and constraints both operational or financial. Throughout the iterative webinar development process, the team invited the Director of Procurement to provide feedback and guidance given his expertise and supplier relationships.

Webinar 1, titled Steelcase's Vision for the Future, presented how climate science and environmental stewardship served as an impetus for Steelcase's sustainability strategy and progress in the past, present, and future. This introductory webinar communicated Steelcase's recently launched Carbon Strategy, demonstrated why the engagement and active involvement of

suppliers will be necessary going forward, and articulated the inevitable business impacts that climate change will induce if adequate measures are not implemented beforehand.

Webinar 2, titled GHG Accounting 101, aimed to bring all suppliers to the same level of understanding by discussing the benefits and fundamentals of greenhouse gas accounting at length. This technical presentation provided examples of emissions calculations, overviews of key organizations and their resources, and more the steps that suppliers should expect to take in their journey to building a baseline emissions inventory. Using Steelcase as an example, suppliers received valuable and first-hand insights for key decision points such as boundary setting or calculation approaches to quantify GHG emissions.

Webinar 3, titled Communicating GHG Emissions, gave suppliers a defined framework by which to report their emissions to Steelcase in addition to internal and external stakeholders given the increasing value in conveying supply chain transparency, resource efficiency, and other sustainability progress to investors, competitors, and the public. To accompany this webinar, the team designed a simple Excel template for suppliers to report annual emissions to Steelcase, also serving to familiarize suppliers with standards for broader reporting and to support the science-based target setting process.

The completion of the project occurred before the team could build and present Webinars 4 through 6 in this series. However, the team contributed to the overall vision and progression of these webinars and supplied Steelcase with preliminary outlines. Webinars 4 and 5 include an explanation of what science-based targets are and why they are important followed by opportunities for suppliers to reduce emissions, respectively. The series will culminate with a step-by-step walkthrough to set a science-based target in Webinar 6, so that suppliers feel prepared to move forward independently. That said, Steelcase will continue to communicate with suppliers during the next phase of supplier engagement albeit with a potentially less direct format.

Assumptions and Limitations

The onset of the COVID-19 pandemic in early 2020 precluded the team from meeting in person with both Steelcase employees and suppliers throughout the entire duration of the project. Despite this obstacle, the team continued to meet remotely with Steelcase on a weekly basis and launched a webinar series for suppliers.

While the EEIO spend-based method provided a reasonable estimate for supplier emissions, the team relied on US input-output data for all suppliers even though roughly 40% of the supplier base is located in other regions of the world. The team did not have sufficient computing capacity to derive emissions factors from Eora's 190-country multi-region input output model. Moreover, as noted above, the most recently available Eora data is from 2015, representing a four-year misalignment with the 2019 supplier spend data that was analyzed.

In general, the team's approach focused more on US suppliers than EMEA or APAC suppliers given limited understanding of and access to those business contexts.

Recommendations

Inventory

Build on improvements in data management practices by further transitioning from spend-based to supplier-specific methods and developing supportive processes

Going forward, Steelcase should focus on developing a structured supplier emissions data intake process to ensure clean, consistent, and objective data from all suppliers. Steelcase and the team made initial estimates of its scope 3 PGS and T&D emissions using a spend-based method, an acceptable method for reporting and target-setting. Given that Steelcase opted for a supplier engagement target for these emissions, it should now transition to a supplier-specific method in which suppliers report annual scope 1 and 2 emissions data to Steelcase. This should enable more accurate reporting of this category of scope 3 emissions, though as noted earlier, this method still involves data quality risks given each supplier's data source and methods. The Excel reporting template created by the team to accompany webinar 3 will be an important base on which to develop best practices for direct supplier reporting, reducing data collection burdens for both Steelcase and its suppliers. Additional processes will need to be developed to ensure the data collection and reporting process is clear and accessible for all suppliers. Once established, Steelcase will have the ability to more efficiently analyze the data, identify trends and strategic insights, and report its own emissions data annually.

Balance the trade-offs between increasing granularity of data with the associated costs

Because granularity and accuracy of spend-based emissions factors may come at a cost, Steelcase should weigh the benefits of those data improvements over the costs of achieving them. Given that suppliers will increasingly be reporting emissions directly to Steelcase as described above, the relevance of these calculation methods may decrease in the years ahead. That said, where the spend-based method is still required to estimate remaining emissions around suppliers and activities for which there is insufficient primary data, Steelcase should leverage more granular emissions factors such as the 429 sectors from Eora as compared to the 36 from the WRI Scope 3 Evaluator Tool. Though continued access to Eora EEIO tables will likely require a data license, publicly available alternatives exist and can be considered. For example, during the summer of 2020, the EPA published a set of supply chain emissions factors for 395 industries based on the Bureau of Economic Analysis's input-output tables.[19] Regardless of the source, whether Eora, EPA, or otherwise, Steelcase should consider the recentness and the multi-regionality of the emissions factors, as described in the limitations section above.

Moreover, because the team used its best judgment to classify Steelcase suppliers into the input-output sectors, some error likely exists in those classifications. The North American Industry Classification System (NAICS) is the standard system used by Federal statistical agencies (like the Bureau of Economic Analysis) in classifying business establishments for the collection, analysis, and publication of statistical data related to the business economy of the U.S., and thus NAICS codes are generally correlated with those used in Eora. NAICS offers a Company Lookup Tool for purchase,[20] which would allow the lookup and accurate categorization of companies according to their NAICS code. These sectors could then be included in each supplier's record in the Steelcase supplier information system for easy reference. Still, Steelcase should consider whether this level of accuracy is critical to achieving its goals.

Bolster the scrap tracking initiative and implement strategies to minimize waste-to-landfill

Steelcase should bolster its scrap tracking initiative to better evaluate how much overall waste is generated throughout a product's manufacturing process to identify hotspots of waste generation and inefficient techniques. This initiative can increase the accountability of any unplanned scrap generated and incentivize employees to limit this waste. Top-down implementation paired with bottom-up cooperation and engagement for this initiative will highlight employee perspectives and barriers to execution.

Given that many products utilize steel, the potential to substitute recycled steel for a significant portion of virgin material inputs proved to be an environmentally sound strategy while also delivering tremendous cost savings. Though all steel that Steelcase discarded was sent to recycling facilities, this would still result in more energy and emission intensive processes than simply incorporating the steel waste directly into manufacturing operations avoiding the need of additional transportation and its associated emissions. This would require collaboration and coordination from multiple departments to ensure that product quality is not compromised but would result in significant emissions savings.

Wood waste proved to be more challenging to divert from landfill due to new projects with backer and laminate materials attached to the wood pieces. The addition of this synthetic adhesive compound disqualified wood waste for composting, a sustainable waste management method due to its low energy demand. Sample wood materials were sent to a composting facility near the wood plant in West Michigan, but these materials did not pass the testing. Steelcase can expect that this wood waste will continue to cause compliance issues and reconsider the value of having laminate and backer attached to the wood components.

Reducing cardboard waste presents itself as an opportunity to reduce excess packaging for Steelcase products during transport and delivery. Alternatively, considering the durability of cardboard, Steelcase can encourage reuse options both internally to its employees and externally throughout the supply chain to grant materials a longer life span reducing their overall impact.

Trash is the most emission intensive commodity as it is inevitably landfilled and accumulates primarily in office spaces and manufacturing facilities. Steelcase has plans to eliminate single-use plastics in all cafeterias by 2025. This can be combined with adding composting bins to its cafeterias to further decrease trash and support employee engagement. In this way, nudging employees to alter their behavior in the cafeteria will eventually bring about the desired change at their workstation. However, it is crucial to involve the feedback of employees to ease their implementation and avoid backlash. Employees are the backbone of any new initiative and their secure buy-in is essential for its success.

Communication

Facilitate understanding and engagement across the organization

Given the relevance of emissions reduction targets to Steelcase business units and teams beyond the Climate, Energy, and Renewables team, we recommend a continued emphasis on business unit-specific communications and cross-unit engagement. Given the ambition of Steelcase's climate strategy, the awareness, buy-in, and active participation of all business units will be essential in achieving the targets set forth in the strategy.

Supplier Engagement

Expand supplier engagement infrastructure beyond the webinar series

As Steelcase continues to develop its supplier engagement strategy beyond the webinar series, it should consider adding on optionality and accountability mechanisms to engage and incentivize suppliers. Steelcase can offer tiered ranges of sustainability performance for suppliers to be recognized at different stages of their sustainability journeys. There should be an objective, consistent criteria for each stage of sustainability maturity to incentivize growth for suppliers at earlier stages and recognize others who have achieved great strides in emissions reduction and circularity at their organization. One suggestion is to evaluate all suppliers based on the metrics they report to Steelcase via the reporting criteria that the team created in preparation for Webinar 3, allowing for consistent and objective evaluation. Steelcase could then separate suppliers into quartiles based on net and percentage decreases in emissions year-over-year. This would allow recognition of small and large suppliers, while also giving all suppliers a reference point for average emissions reductions across the supply chain.

Moreover, using the metrics designed for the recently launched Supplier Scorecard will provide a level of supplier accountability and competition for science-based target setting and emissions reductions efforts, and should be included in the criteria for "Premier Status." The Scorecard can reinforce the importance of suppliers pursuing sustainable operations and position this effort as a key priority for ongoing supplier relationships. Moreover, Steelcase can consider making strategic procurement decisions based on Scorecard results by purchasing more from established suppliers

that are achieving the defined sustainability milestones, while shifting away from suppliers that do not pursue or prioritize sustainability in their operations and identifying new suppliers as necessary. Together this will provide the grounds on which current suppliers can make a business case for prioritizing these efforts internally.

Beyond the webinar series and supplier scorecard, Steelcase may consider other supplier engagement avenues to facilitate the dissemination of information and the sharing of best practices across the diverse supplier base. For example, Steelcase could create a supplier platform to serve as both the reporting tool as well as a forum for discussion and sharing of best practices among suppliers and the dissemination of key information from Steelcase. Steelcase could also use regular newsletters, open events, or interactive meetings that encourage dialogue between and across Steelcase and suppliers around sustainability.[21]

Support policies and initiatives that decarbonize manufacturing and transportation

Even with climate priorities defined and ambitious targets set, Steelcase and its suppliers cannot hope to fully decarbonize their operations and business activities without innovative technologies, primed markets, and supportive government policies in place. The opportunity is now to set in motion the programs and policies that will enable a decarbonized global economy by 2050, and companies like Steelcase have an important role in shaping and enabling this movement.

Industrial emissions - like those driving Steelcase's supply chain - account for 22% of US emissions[22], including those from burning fossil fuels on site, from chemical, metallurgical, and mineral transformation processes, and from waste management activities.[23] Despite the magnitude of these emissions, current technologies are insufficient to fully decarbonize the sector, and cleaner industrial process pathways and clean heat alternatives are needed. As such, policies that provide significant R&D investment for industrial decarbonization technologies will be critical. Concurrently, Steelcase can advocate for policies that enable the development of markets and incentives to scale these solutions and bring the costs down, knowing that small- and medium-sized suppliers often cannot afford to be early adopters of new technologies and processes. Where materials and processes simply cannot be further decarbonized, Steelcase should support policies that advance the commercialization of carbon capture utilization and storage technologies.[24]

Transportation emissions - like those from transporting Steelcase's materials and products in cars, trucks, ships, trains, and planes - account for 24% of US emissions, as over 90 percent of the fuel used for transportation is petroleum based (primarily gasoline and diesel). As such, Steelcase should support policies and initiatives that enable the advancement and scaling of electrified transportation, whether through the expansion of charging infrastructure that could be leveraged by an electrified fleet, or through investment dollars for heavy and long-distance transport, as those activities are relatively lacking in options for decarbonization today.

Appendices

Appendix A: Ecosystem of Players in GHG Accounting

The deliverables of this project were guided primarily by the frameworks and best-practices of several key industry organizations: the Greenhouse Gas Protocol (GHG Protocol), the Science-Based Targets Initiative (SBTi), and CDP (formerly known as the Carbon Disclosure Project). The GHG Protocol sets comprehensive global standards to measure and manage scopes 1, 2, and 3 emissions. SBTi defines best practices in science-based target setting - targets that are in line with the rate of decarbonization required to avoid the worst impacts of climate change as defined by climate science - and then independently assesses and approves companies' targets. CDP, then, runs one of the primary global environmental disclosure systems through which companies disclose their emissions, targets, and mitigation strategies. As such, the team leveraged the GHG Protocol standard for our scope 3 baseline setting; supported target setting based on SBTi guidance and submitted those targets to SBTi for validation; and supported Steelcase in its disclosure of the calculated baselines and developed targets to CDP.

Appendix B: Table of Selected Scope 3 Categories

(#) Category	Category description	Minimum boundary
(1) Purchased goods and services	Extraction, production, and transportation of goods and services purchased or acquired by the reporting company in the reporting year, not otherwise included in Categories 2 - 8	All upstream (cradle-to-gate) emissions of purchased goods and services
(4) Upstream transportation and distribution	Transportation and distribution of products purchased by the reporting company in the reporting year between a company's tier 1 suppliers and its own operations (in vehicles and facilities not owned or controlled by the reporting company) Transportation and distribution services purchased by the reporting company in the reporting year, including inbound logistics, outbound logistics (e.g., of sold products), and transportation and distribution between a company's own facilities (in vehicles and facilities not owned or controlled by the reporting company)	The scope 1 and scope 2 emissions of transportation and distribution providers that occur during use of vehicles and facilities (e.g., from energy use) *Optional*: The life cycle emissions associated with manufacturing vehicles, facilities, or infrastructure
(6) Waste generated in operations	Disposal and treatment of waste generated in the reporting company's operations in the reporting year (in facilities not owned or controlled by the reporting company)	The scope 1 and scope 2 emissions of waste management suppliers that occur during disposal or treatment *Optional:* Emissions from transportation of waste

Table 1: Description and boundaries of the three upstream scope 3 emissions categories within the project scope.[25]

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[8] This method was in line with the GHG Protocol guidance to assess only the largest suppliers accounting for at least 80% of spend, plus any additional suppliers within the remaining 20% that individually account for more than 1% of spend or are relevant for other reasons. (Scope 3 Standard)

[9] Compared to the 36 used to estimate Steelcase's scope 3 emissions in the previous years, using the WRI Scope 3 Evaluator Tool created by Quantis; this tool is primarily spend-based based on emissions factors from the World Input-Output Database (WIOD).

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