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Consumer Product Manufacturer & Retailer Sustainability Goal Literature Review

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1. Introduction

This report presents findings from a literature review that Apex Analytics conducted on behalf of the Northwest Energy Efficiency Alliance (NEEA). The review sought to investigate the sustainability targets of select appliance and consumer electronics manufacturers and retailers and identify the strategies these companies are pursuing to achieve those targets.

Annual interviews with retailers participating in the ENERGY STAR® Retail Products Platform (ESRPP) program have identified sustainability targets, and particularly Scope 3 carbon reduction goals, as an increasingly important consideration for retailers over the past few years. Scope 3 carbon emissions encompass 15 categories of emissions related to a company's value chain that are out of the direct control of the organization (OAR US EPA 2016). Category 11 emissions – emissions resulting from the use of sold products – are of particular interest to this review since reducing emissions from product use through increasing the energy efficiency of those products aligns the motivations of manufacturers and retailers with NEEA's program efforts.

This review seeks to identify opportunities for NEEA to leverage this alignment in motivations with retailers and manufacturers to accelerate uptake of energy efficient products.

1.1 Research Objectives

NEEA defined the following objectives for this review:

- Compile retailer and manufacturer sustainability goals, broadly defined, and provide a summary of:
    - Which retailers and manufacturers have and have not published sustainability goals,
    - The degree to which each retailer or manufacturer focuses on Scope 3 emissions from the energy use of products sold (or other goals relevant to ESRPP),
    - Strategies retailers and manufacturers are using to achieve their goals.
- Compile information on any current or upcoming regulatory requirements that could guide retailer and manufacturer investment in sustainability and/or energy efficiency.
- Review and summarize industry and academic literature that provides insight or narrative on individual retailer or manufacturer goals, including which are leaders or investing most heavily.
- Provide recommendations for how the ESRPP program could provide value to retailers or manufacturers pursuing sustainability goals and strategies likely to be most effective.

NEEA identified a set of national retailers and manufacturers to include in this review, as listed in Table 1. The selected organizations include all four of the retailers participating in the ESRPP program, but also include other national retailers selling appliances and consumer electronics products.

Table 1: Targeted Market Actors

Type	Companies	ESRPP Participant
Retailers	Amazon	
	Best Buy	X
	Costco	
	Home Depot	X
	Lowe's	X
	Nationwide Marketing Group	X
	Walmart	
Manufacturers	GE	
	LG	
	Samsung	
	Whirlpool	
	Electrolux	
	Vizio	
	Sony	

1.2 Research Approach

Apex compiled information from a variety of secondary sources to inform this review, including:

- **Company sustainability reporting**: We reviewed annual Environmental, Social, and Governance (ESG) or similar reports from the targeted companies, as well as supporting documents the companies published, their sustainability-focused websites, and press releases. Where feasible, we reviewed up to three years of sustainability reports for each company.
- **Third-party ESG ratings and assessments**: A variety of organizations aggregate information about companies' sustainability goals and efforts and make that information available to investors and other interested parties. These organizations include the Climate Disclosure Project (CDP), the Science-Based Targets Initiative (SBTi), and MSCI, a private data aggregator.
- **Industry whitepapers and guidance**: Large consulting firms like McKinsey and Company, Boston Consulting Group, and PwC have identified companies' growing interest in carbon reduction and published a range of whitepapers and other guidance discussing strategies companies can pursue to reduce their carbon emissions, including Scope 3.
- **Popular media and general web searches**: Apex consulted a variety of additional sources to inform this review, including articles in popular media tracking trends in ESG efforts and reporting. We also reviewed information about relevant regulation, including public comments from market actors.

1.3 This Report

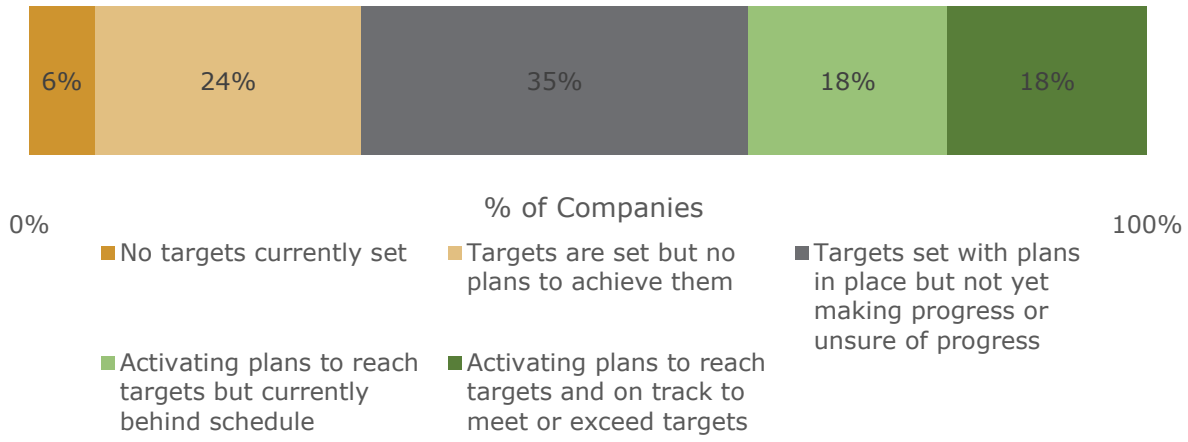
The remainder of this report begins with a brief discussion of the motivation for companies' ESG goals and reporting and overarching considerations related to sustainability efforts. It then details the sustainability efforts of each of the targeted market actors.

2. Overarching Findings

2.1 Market-Wide Scope 3 Emissions Reduction Activity

Scope 3 emissions are an important consideration for companies seeking to reduce their carbon emissions. The consulting firm McKinsey and Company reported that Scope 3 emissions can account for 80% of the carbon emissions for many companies, and as much as 98% of emissions for some sectors, like home and fashion retailers (Bhargava, Hoffman, and Jakic 2022). A survey of retailer sustainability practices by another consulting firm, Boston Consulting Group (BCG), found that a majority of respondents believed their companies had "bold and differentiated" goals, although far fewer had activated plans to reach Scope 3 goals and fewer still reported those plans were on schedule (Figure 1) (Boston Consulting Group 2022).

Figure 1: Surveyed Retailer Progress on Scope 3 Emissions Goals (Reproduced from Boston Consulting Group 2022)



Data from: BCG Global Survey on Retail Sustainabilty Maturity. n=37 companies. March 2022. BCG analysis

A report from MSCI, a firm that provides research and data to investors, found that 37% of the more than 9,000 companies on MSCI's Investable Market Index disclosed at least some of their Scope 3 emissions. More companies disclosed upstream Scope 3 emissions (82% of 3,364 companies reporting), like those generated by their suppliers and by shipping products to their facilities, than downstream Scope 3 emissions (57%), including emissions from use of products sold. While these figures include firms across industries, the report's findings suggest that these broader figures are likely representative of the Consumer Discretionary category, which includes the retailers and manufacturers included in this review. The share of companies with Net Zero targets in the Consumer Discretionary category (32%), was equivalent to the share of the total sample with Net Zero targets (MSCI 2023).

2.2 Market Actor Motivations

Two key factors are driving companies' increasing focus on sustainability broadly, including Scope 3 emissions reductions: pressure from investors and regulatory actions that have grown from that pressure.

2.2.1 Investor Pressure

Pressure from investors is a primary motivation for companies, including the retailers and manufacturers included in this review, to pursue carbon emissions reductions and other ESG goals. Investors' focus on ESG goals became particularly prominent in 2018, when Larry Fink, the chief executive of Blackrock, encouraged companies to consider their role in the community, their environmental impact, and the diversity of their workforce in his annual letter to CEOs (Goldstein and Farrell 2022). While other financial institutions had previously set goals to reach net zero carbon emissions within their lending and other activities, Blackrock's announcement was one of the first to include stocks and other financial assets (Eavis and Krauss 2021). Other large investors, including Vanguard, also made statements in support of ESG efforts.

Large investors' focus on ESG provides both benefits for companies that pursue ESG goals and risks for those that do not. Failing to focus on ESG goals poses risks to companies in that investors have threatened to vote against directors and management at companies that investors determine do not have sufficiently clear reporting on ESG topics like carbon emissions and credible plans to improve in those areas (Eavis and Krauss 2021). Activist investors have pressured companies to first disclose their carbon emissions and then develop plans to cut emissions (Eavis 2022).

The primary benefit for companies in pursuing ESG goals is the potential for increased investment from ESG-focused funds. The consulting firm McKinsey and Company reports that ESG-focused funds have more than $1 trillion under management, and investors expect that amount to increase. While this is a relatively small part of the $109 trillion invested in global equity markets (Neufeld 2023), McKinsey reports that it has the potential to drive up share prices for "high-sustainability companies" and lowering them for other companies (Bhargava, Hoffman, and Jakic 2022). Euronext, a pan-European stock market, created multiple indexes limited to companies with SBTi-approved emissions goals, indicating that investors may be more and more interested in the futures of companies with clear commitments to sustainability (Day, White, and Bloomberg 2023).

2.2.2 Regulatory

Regulatory pressure to require companies to report on carbon emissions has grown out of investor interest in companies' ESG performance. Regulators have sought to develop rules that would standardize reporting across companies to better enable investors to compare performance. These regulatory efforts have been driven by the Securities and Exchange Commission (SEC), the State of California, and the European Union.

2.2.2.1 SEC Climate-Related Disclosures Rule

In March of 2022, the Securities and Exchange Commission (SEC) proposed a rule that would require companies to include estimates of their climate-related risks and greenhouse gas emissions in their financial statements. For larger companies, these disclosures would include Scope 3 emissions if those emissions were large enough to be "material,"[1] or if the company had set a public goal related to reducing Scope 3 emissions (U.S. Securities and Echange Commission 2022). The rule was set to take effect in the middle of 2023 but was delayed due to the volume of feedback the SEC received in the

[1] In financial reporting, information is considered "material" if investors or other users of the reports would reasonably change their decisions or actions if that information were not fully and accurately reported.

public comment period. On March 6, 2024, the SEC finalized the rule, removing the requirement that companies report Scope 3 emissions (Tabuchi, Livini, and Gelles 2024).

The disclosure requirements around Scope 3 emissions were among the most controversial parts of the proposed SEC rule. While other elements of a financial statement rely on a company's own data, reporting on Scope 3 emissions requires companies to gather external data from their suppliers and other sources. Companies objected to the Scope 3 reporting requirements due to the difficulty of obtaining these external data and the uncertainty inherent in the available data.

Both Walmart and Amazon filed comments opposing (Walmart) or suggesting significant changes (Amazon) to the SEC's proposed Scope 3 reporting requirements. As Amazon explained in its comments, "We have a very sophisticated carbon accounting system and spend a considerable amount of time and resources on calculating accurate emissions. Yet, the Scope 3 data that is available to us frequently is coarse and in some cases the data is confidential or simply doesn't exist" (Huseman 2022). Walmart expressed similar concerns in its comments, saying, "For a multicategory retailer to calculate its Scope 3 footprint at scale, it must rely on broad assumptions and unreliable estimates of emissions. In essence, current Scope 3 calculation involves estimations on top of assumptions that are repeatedly layered to arrive at a falsely precise number" (Walmart Inc. 2022).

In particular, Amazon stated that suppliers may be reluctant to share data on their operations and business processes needed to calculate Scope 3 emissions due to competitiveness concerns. Walmart further noted that gathering emissions data from actors further up their supply chains, with whom they do not have direct relationships, could be particularly difficult. Both Walmart and Amazon also expressed concern that the SEC's requirement that companies with public Scope 3 reduction goals must report their Scope 3 emissions could have the unintended consequence of preventing companies from setting Scope 3 goals.

2.2.2.2 California Climate Corporate Data Accountability Act

California's governor, Gavin Newsom, signed Senate Bill (SB) 253, the Climate Corporate Data Accountability Act, into law in October 2023.[2] The bill requires companies to disclose Scope 1 and Scope 2 emissions beginning in 2026 and Scope 3 emissions beginning in 2027. SB 253 applies to companies that have annual revenues greater than $1 billion, do business in California, and were formed in the US. This makes it more stringent than the proposed SEC rule in the sense that all companies meeting the law's size threshold must report Scope 3 emissions, not just those with stated goals or for whom Scope 3 emissions are considered material (Cheng, Zilberberg, and Roberts 2023).

The California Air Resources Board (CARB) is in charge of enforcing SB 253. The legislation requires CARB to issue reporting requirements by January 1, 2025, and legal analysts expect there will be extensive comments and likely legal challenges (Cheng, Zilberberg, and Roberts 2023). In response to concerns about the availability of data needed for Scope 3 reporting, the law does not penalize companies "for [Scope 3] disclosure made with reasonable basis/good faith," and until 2030, the only penalties related to Scope 3 reporting will be for failure to file (Cheng, Zilberberg, and Roberts 2023). Similar bills are pending in New York.

[2] At the same time, Governor Newsom signed a second climate-related bill into law, SB 261, the Climate-Related Financial Risk Act, which requires companies to disclose climate-related financial risks.

2.2.2.3 EU Corporate Sustainability Reporting Directive

On January 5, 2023, the European Union (EU) passed the Corporate Sustainability Reporting Directive (CSRD). The directive applies to companies that are listed on an EU-regulated market, or that do business in Europe and meet certain size requirements in terms of total revenue. EU member states have until July 2024 to incorporate its provisions into their national laws. The directive will require large companies listed on European markets to begin reporting as soon as 2025 (in the 2024 fiscal year), although requirements will phase in for smaller companies and companies not listed on European markets through 2029. Companies will have a three-year grace period to develop their Scope 3 reporting to allow them to develop processes to collect the necessary data (O'Connell, Horn, and McNaughton 2023).

Like California's SB 253, Scope 3 reporting requirements will apply to all companies subject to the CSRD. The directive has more stringent assurance requirements around Scope 3 reporting than the California law or the SEC rule, requiring auditing of all sustainability information, including Scope 3. The CSRD is also broader than the SEC's proposed rule or California's legislation in that it requires companies to report on 12 areas related to all aspects of ESG, not just greenhouse gas emissions.

2.3 Company Strategies to Reduce Scope 3 Emissions

Large consulting firms have identified a variety of barriers that companies face to accurately tracking their Scope 3 emissions and achieving Scope 3 reduction goals and recommend a variety of actions that companies can take to overcome those barriers. The primary barriers revolve around data collection and tracking of Scope 3 emissions. Companies may face challenges in both aggregating and managing internal data and in collecting external data needed to calculate Scope 3 emissions.

Internally, to report Scope 3 emissions, companies may need to integrate carbon accounting approaches across different parts of the organization. Software vendors have started offering products to support this type of company-wide tracking and reporting (Spiller 2021). Reporting Scope 3 emissions also requires companies to gather data from their suppliers and other sources, which can be imprecise and difficult to obtain. According to one report by McKinsey and Company, "Emissions calculations are usually based on rough activity data and standard (meaning average) emissions factors. In the world of financial accounting, this level of approximation would be the equivalent of companies using average industry costs and revenues to prepare their annual financial statements"(Spiller 2021). In particular, the report notes a need for more granular, company-specific data at the product level.

The large consulting firms reporting on Scope 3 emissions identified a variety of strategies companies can undertake to improve their reporting and meet their Scope 3 goals, including internal actions, supplier-focused actions, and market-focused actions. Multiple consulting firms recommended that companies set large, visible goals and take significant action to reduce their carbon emissions, rather than taking a more incremental approach, in order to capture the attention of investors and customers (Spiller 2021; Boston Consulting Group 2022).

2.3.1 Internal Actions

Internal actions that consulting firms recommended included:

- **Clear goals and incentive systems to support them:** Companies can develop clear and straightforward goals around carbon reductions, including Scope 3, and establish internal incentive structures to support those goals. These internal incentives can range from tying

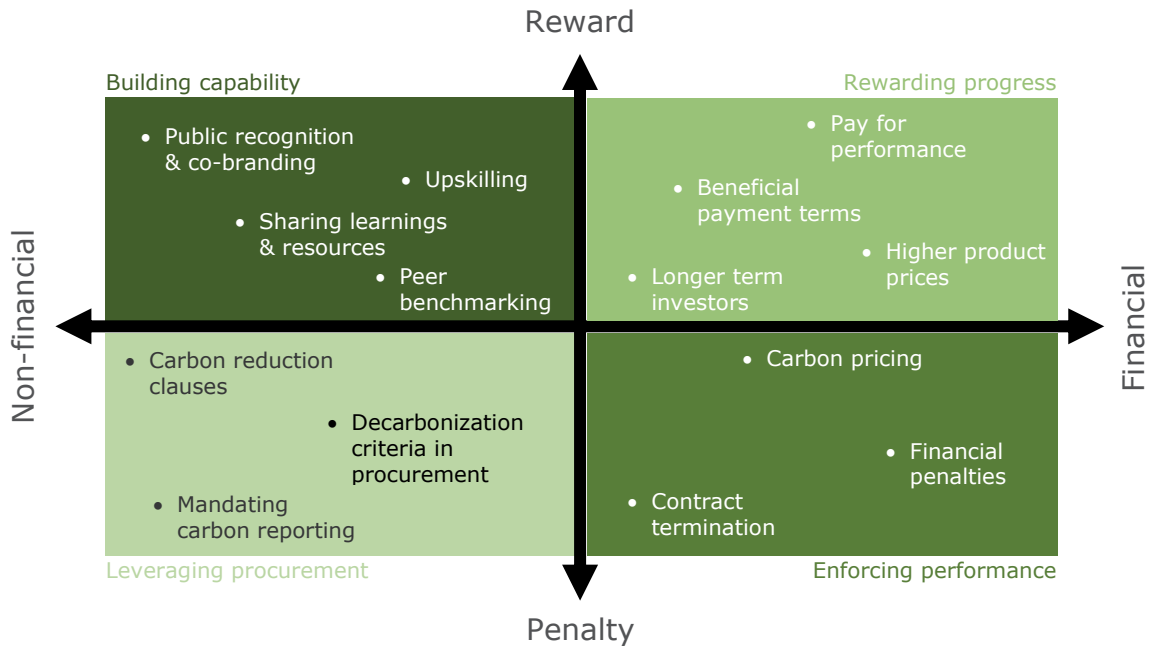
compensation to sustainability measures and embedding them in business planning decisions to developing internal carbon pricing systems (Spiller 2021). Relatively few retailers have incorporated sustainability into compensation or business planning, particularly for staff members beyond their sustainability teams (Boston Consulting Group 2022). McKinsey reported that 23% of the 2,600 companies they interviewed in 2020 were using an internal carbon charge and an additional 22% planned to adopt one within the next two years (Spiller 2021). This is consistent with the BCG retailer survey, which found that, in 2022, 34% of surveyed retailers had internal carbon pricing. However, the BCG survey found that, in the vast majority of those organizations, the carbon pricing efforts applied only to the sustainability team or others with direct impact on sustainability efforts. Only 3% reported internal carbon pricing applied across nearly all teams or business units (Boston Consulting Group 2022).

- **Consumer research and product analysis:** Companies can conduct market research focused on sustainability to understand customers' willingness to pay for sustainable products and the best ways to position those products (Bhargava, Hoffman, and Jakic 2022). At the same time, companies can analyze their product mix to identify products with the most promising combination of potential for both revenue and emissions reduction (Morrison and Burwell, n.d.).
- **Consideration of decarbonization in procurement:** Companies can work with vendors to obtain materials or products with a lower carbon footprint (Bhargava, Hoffman, and Jakic 2022). The BCG survey found that procurement and supply chain teams were among those most often engaged with or driving sustainability efforts, with more than three quarters of respondents reporting these teams were engaged. Merchandising teams were engaged with or driving sustainability efforts less often, with about half of respondents reporting these teams were engaged (Boston Consulting Group 2022).

2.3.2 Supplier-Focused Actions

Large consulting firms identified a variety of actions a company can take to motivate its suppliers to reduce their carbon emissions or the emissions associated with the products they supply. PwC categorized these strategies according to whether they imposed a reward or a penalty on the supplier and whether that reward or penalty was financial or non-financial. Figure 2 recreates a graphic PwC developed to illustrate this taxonomy (Morrison and Burwell, n.d.).

Figure 2: PwC Taxonomy of Strategies to Motivate Suppliers to Decarbonize



Reproduced from: PwC and World Business Council for Sustainable Development, ***Reaching Net Zero: Incentives for Supply Chain Decarbonization***

In their annual interviews, ESRPP retailers reported carrying out some of the strategies that the taxonomy categorizes under "building capacity," including benchmarking suppliers against each other in terms of their ENERGY STAR offerings and providing public recognition in the form of vendor sustainability awards. As described further below, Amazon, with its Climate Pledge, and Walmart, with its Project Gigaton, also carry out many of the activities described above, for example providing public recognition and co-branding, as well as providing financing and beneficial payment terms for sustainable products.

2.3.3 Market-Focused Actions

In addition to internal efforts and supplier-focused efforts, large consulting firms suggested that companies should engage with a variety of other market actors around carbon reduction and reporting, including:

- **Investors**: Companies can engage with ESG-focused institutional investors in developing their carbon reduction strategies, to gain investors' advice and buy-in on those strategies (Bhargava, Hoffman, and Jakic 2022).
- **Government/regulators**: Companies can be involved in the process of developing laws and regulations related to decarbonization and greenhouse gas reporting, for example submitting comments as part of public comment periods (Bhargava, Hoffman, and Jakic 2022). Walmart and Amazon both submitted comments related to the SEC's proposed carbon reporting rules. The other firms included in this review did not submit direct comments, although they may be

part of industry groups like the National Retail Federation or the Consumer Technology Association that commented.[3]

- **Industry coalitions**: Companies can develop and take part in industry coalitions related to decarbonization and emissions reporting to help address common challenges (Bhargava, Hoffman, and Jakic 2022). Examples include Amazon's Climate Pledge and Walmart's Project Gigaton. While most of the retailer respondents to the BCG survey reported participating in industry coalitions and believe collaboration will be important, only 3% reported those coalitions "had a very high impact on their sustainability efforts"(Boston Consulting Group 2022).

3. Company Specific Findings

3.1 Manufacturers

The manufacturers included in this review vary widely in the amount of carbon emissions they reported for 2022, the most recent year available, likely reflecting differences in the size and scope of their businesses (Table 2). For example, LG's reported emissions encompass the entire enterprise, including the Electronics division, which produces the company's appliances and manufactures display panels, as well as Chemical and Telecommunications divisions. Nonetheless, Scope 3 emissions make up large majorities of total emissions for all but one manufacturer,[4] and emissions resulting from the use of sold products make up a majority of those Scope 3 emissions for all manufacturers for which data were available.

Table 2: Manufacturer Reported Carbon Emissions, 2022

Company	Scope 1	Scope 2	Scope 3	Scope 3 as % of Total	Use of Sold Products	Us of Sold Products as % of Scope 3
	Million Metric Tons (MMT) CO_2 equivalent (CO_2e)				*MMT CO_2e*	
LG*	7.44	11.92	4.92	20%	4.20	85%
Electrolux	0.07	0.02	*Not Reported*	N/A	*Not Reported*	N/A
Sony	0.23	0.73	20.45	95%	11.80	58%
Whirlpool	0.15	0.31	*Not Reported*	≥99%	53.30	N/A
Samsung	5.97	9.08	124.72	89%	101.24	81%
Vizio	*Not Reported*					
GE Appliances	*Not Reported*					

*Emissions reported are enterprise-wide, not limited to LG Electronics.

All but two of the manufacturers included in this review have set targets to reduce their Scope 1 and

[3] The full list of commenters is available at: https://www.sec.gov/comments/s7-10-22/s71022.htm

[4] Scop 3 emissions' smaller share of total emissions for LG likely reflects the Scope 1 and Scope 2 carbon intensity of the company's chemical division as well as its display manufacturing division, which together account for 79% of total Scope 1 and 2 emissions.

Scope 2 carbon emissions (Table 3). All manufacturers with targets eventually seek net zero Scope 1 and Scope 2 emissions, although some have set interim goals for incremental reductions.

Table 3: Manufacturer Scope 1 and Scope 2 Goals

Company	Goal	Baseline Year	Target Date
LG*	27% reduction in Scope 1 & 2 emissions	2018	2030
	62% reduction in Scope 1 & 2 emissions	2018	2040
	Net zero	N/A	2050
Electrolux	80% reduction in Scope 1 & 2 emissions	2015	2025
	Net zero	N/A	2030
Sony	100% renewable energy	N/A	2030
	Net zero	N/A	2030
Whirlpool	Net zero	N/A	2030
Samsung	100% renewable energy	N/A	2050
	Net zero	N/A	2050
Vizio	*Not Reported*		
GE Appliances	*Not Reported*		

*Targets are enterprise-wide, not limited to LG Electronics

Most of the manufacturers included in this review have set targets to reduce their Scope 3 emissions (Table 4). Most of these goals set 2030 as a target date and seek emissions reductions ranging from 20% to 30%.

Table 4: Manufacturer Scope 3 Goals

Company	Goal	Baseline Year	Target Year
LG	20% reduction in "usage-phase emissions"[1]	2020	2030
Electrolux	25% reduction in Scope 3 emissions from use of products sold	2015	2025
	Fully climate neutral	N/A	2050
Sony	45% reduction in Scope 3 emissions	2021	2035
	Net zero	N/A	2040
Whirlpool	20% emissions reduction from product use	2016	2030
Samsung	30% reduction in energy use of key product categories[2]	2019	2030
Vizio	None listed	N/A	N/A
GE Appliances	Transition 100% of US-manufactured refrigeration products to low Global Warming Potential (GWP) refrigerants	2022	2025

[1] Goal applies to: TVs, refrigerators, clothes washers, clothes dryers, room air conditioners, mini-split air conditioners, and monitors.
[2] Goal applies to: TVs, refrigerators, clothes washers, room air conditioners, monitors, PCs, and smart phones.

The most common strategy manufacturers described to reduce the carbon emissions attributable to the products they sell involved engaging with suppliers to reduce upstream emissions (Table 5). Manufacturers also frequently reported developing "road maps," describing specific plans for each product group.

Table 5: Manufacturer Strategies to Reduce Emissions from Product Use

Strategy	LG	Electrolux	Sony	Whirlpool	Samsung	Vizio	GE
Internal product efficiency ratings	X						
"Road maps" for improvement by product group	X	X	X				
Environmental performance integrated into Research & Development (R&D) and product development (efficiency targets & Key Performance Indicators (KPIs))		X					
Engagement with suppliers		X	X	X	X		
Customer engagement to increase efficiency of product use		X		X			
Support electric grid decarbonization				X			
Development of energy saving smart/artificial intelligence (AI) features				X	X		
Adoption of low GWP refrigerants							X
Strategies not reported						X	

3.1.1 LG

Enterprise-wide, LG has set sustainability goals that focus on achieving net zero carbon emissions and heavily reference international targets like the Paris Agreement and the SBTi. Table 6 lists these enterprise-wide goals. As the table suggests, LG has defined targets that increase in stringency over time, ultimately leading to a target of net-zero emissions by 2050.

Table 6: LG Enterprise-Wide Carbon Reduction Goals

Goal	Baseline Year	Target Date
27% reduction in Scope 1 & 2 emissions	2018	2030
62% reduction in Scope 1 & 2 emissions	2018	2040
Net zero	N/A	2050

The targets in Table 6 apply across LG's entire enterprise, which covers the fields of electronics, chemicals, and telecommunications and services. LG Electronics, the division that manufacturers LG's appliances and TVs, is a relatively small contributor to the company's overall Scope 1 and 2 emissions, accounting for 6% of the company's 2018 emissions, which it uses as a baseline (ESG Department, LG Electronics 2022). LG Chemical was the largest contributor to Scope 1 and 2 emissions, at 47%, followed by LG Display, the division that manufactures display panels, at 32%.[5]

While LG's enterprise-wide ESG report states the company's aggregate Scope 3 emissions, it does not mention an enterprise-wide Scope 3 goal. LG Electronics, however, published its own sustainability report for 2021-2022, which describes a goal for reducing Scope 3 carbon emissions from the use of seven major products by 20% by 2030, relative to a 2020 baseline. As of 2021, the company reported a 6.6% reduction in per-unit emissions. The products subject to this goal are TVs, refrigerators, clothes washers, clothes dryers, room air conditioners, mini-split air conditioners, and monitors. Emissions from use of sold products accounted for more than 99% of the Scope 3 emissions LG Electronics reported for

[5] LG Display manufactures display panels for TVs, laptops and computer monitors, mobile devices, automotive displays, and commercial displays. Manufacturing TVs as an integrated device falls within LG Electronics.

2021 (other categories included business travel and in-house suppliers in Korea) (ESG Department, LG Electronics 2022).

To support its Scope 3 goals, LG Electronics developed an internal "Eco-Index," which rates the "eco-friendliness" of products according to a variety of metrics and assigns them one, two, or three stars, with three stars being the most eco-friendly. Energy efficiency is the primary differentiator between two-star and three-star products, with three-star products "securing competitive advantage and high efficiency," while two-star products "[achieve] average market efficiency." Both two- and three-star products go beyond regulatory requirements for reducing hazardous substances and resource efficiency/recycling requirements (ESG Department, LG Electronics 2022).

LG also reports developing "Technology Road Maps" that set detailed goals for increasing the efficiency and sustainability of each product group. Based on these road maps, the company develops more specific goals for each product development stage to maximize the overall product efficiency (ESG Department, LG Electronics 2022).

3.1.2 Electrolux

As shown in Table 6, Electrolux has set carbon reduction goals ramping up to carbon neutrality (net zero emissions) that align with the SBTi. Electrolux reported achieving its targeted 80% reduction in Scope 1 and 2 emissions three years ahead of schedule, in 2022, and is working to develop new targets aligned with the SBTi (Electrolux Group 2023).

Table 7: Electrolux Carbon Reduction Goals

Goal	Baseline Year	Target Date
80% reduction in Scope 1 & 2 emissions	2015	2025
Net zero	N/A	2030

Electrolux has also set SBTi-aligned Scope 3 goals, seeking to reduce Scope 3 emissions by 25% relative to 2015 levels by 2025 and be fully climate neutral across its value chain by 2050. The company reported that product energy use contributes more than 80% of its total climate impact (Electrolux Group 2023). As with its Scope 1 and 2 goals, Electrolux reported it had fully achieved its Scope 3 goals as of 2022 and was working to develop new targets. Electrolux reported an annual increase in energy efficiency of more than one percent across its global product offerings in 2022 and noted that their "most energy and water efficient products" accounted for 24% of total unit sales and 39% of gross profit.[6]

Electrolux's sustainability report describes a variety of actions the company has taken to increase the sustainability of its products. It has developed a series of roadmaps that provide "a holistic approach to sustainability throughout our value chain." Aligned with these roadmaps, the company has worked to integrate environmental performance into the research and development and product planning processes, including defining efficiency targets for R&D and integrating key performance indicators related to energy efficiency into product planning. The company has also tied environment-related KPIs to its long-term incentive structure for senior managers (Electrolux Group 2023).

One common theme among the specific efficiency innovations featured in Electrolux's most recent sustainability report was the use of technology to enable consumers to operate their appliances more efficiently. For example, the report describes the "Ecometer" feature included in Electrolux's new range

[6] Electrolux classifies its "most energy and water efficient" products according to the European Union's energy labeling system.

of built-in refrigerators, which uses three LED lights to indicate how efficiently the refrigerator is operating based on its current settings. The report also notes adding smart features to "help consumers use their appliances in the most sustainable way" as an area for development. Other areas of development included designing more efficient products to meet new efficiency standards in the European Union and Brazil, indicating that standards are still an important driver of efficiency activity (Electrolux Group 2023).

Electrolux also works with its suppliers through the Carbon Disclosure Project (CDP) Supply Chain Program, which is a non-profit-run system for organizations to disclose their emissions. The company is also involved with United Nations-led efforts like the Business Ambition for 1.5°C Pledge and United 4Efficiency, which focuses on emerging markets (Electrolux Group 2023).

3.1.3 Sony

Sony has goals regarding Scope 1, 2, and 3 emissions as part of their Road to Zero global environmental plan (Sony Group Corporation 2023b), as referenced in Table 8. These targets culminate in net zero emissions across all three scopes by 2040 and follow the SBTi's methodology. Sony originally set a target year of 2050 for these goals but chose to accelerate their target to 2040 in 2022. Sony has a related goal of using 100% renewable electricity in its operations, which it also accelerated from 2040 to 2030 (Sony Group Corporation 2023c). Sony explained this shift in timeline for its environmental goals as the result of "climate change risks [becoming] more apparent and serious worldwide", making "the transition to a decarbonized society" an "urgent issue"(Sony Group Corporation 2023c, 8).

Table 8: Sony Carbon Reduction Goals

Goal	Baseline Year	Target Date
Net zero in Scope 1 & 2 emissions	2018	2030
45% reduction in Scope 3 emissions from product use	2018	2035
100% renewable energy	2018	2030
Net zero in Scope 3 emissions	2018	2040

In their 2023 Sustainability Report, Sony estimated their total emissions volume at 21.42 million metric tons and named "energy consumed during product use" as the highest contributor to general emissions (at 11.795 million metric tons). This is followed by the emissions category of "goods and services procured" producing 6.208 million metric tons of emissions (Sony describes goods and services as "raw materials and components") (Sony Group Corporation 2023c, 36).

Sony's 2023 Sustainability Report described a range of on-going strategic actions to reduce emissions, which included:

- Introducing renewable energy at Sony locations,
- Promoting energy conservation,
- Encouraging partners to reduce their greenhouse gas emissions,
- Providing energy saving products, and
- Investing in startups committed to environmental technologies.

Sony describes its approach to sustainability, saying that it plans to "[accept] responsibility to aim for zero greenhouse gas emissions and [make] contributions through its diverse technologies and businesses"(Sony Group Corporation 2023c, 21).

On the path of reaching their longer-term emissions goal, Sony also set medium-term environmental targets that explain what the company hopes to achieve in five years of action from 2021 to 2025. These Green Management 2025 targets contain supportive, shorter-term goals for their Road to Zero broader strategy, such as the 5% reduction of absolute GHG emissions in operations in 2025 (baseline year of 2020) and a 10% reduction of absolute GHG emissions in logistics (baseline year 2018). The medium-term targets have three immediate strategies, or "focus points." Focus point 1 is to "improve energy- and resource-efficiency of products"; focus point 2 is to "expand renewable energy use"; and focus point 3 is to "enhance supply chain engagement to reduce environment impact" (Sony Group Corporation 2023c, 30).

As part of focus point 1, Sony set a goal to reduce annual energy use per product by 5% by the year 2025 (compared to the baseline year of 2018) and has set specific annual goals for each product category. As examples of the strategies it is using to achieve these goals, Sony cites the BRAVIA television line's auto-power off function, energy savings from more efficient lighting in the VPL-XW5000 video projector, and increased efficiency of professional LED displays through more efficient LED elements (Sony Group Corporation 2023c, 22).

Sony reported an increase in product energy use in 2022 of 3.9% since the baseline of 2018 (Sony Group Corporation 2023a, 170). Sony attributes this energy use increase to additional product features, better performance, and growing product size (Sony Group Corporation 2023c, 43). As shown in Table 9, Sony has been reporting Scope 3 and specifically Category 11 (Use of Sold Products) emissions since 2013.

Table 9: Sony Scope 3 Emissions 2013-2022

Year	Scope 3 GHG Emissions, All (in Million Tons CO2)	Category 11: Use of Sold Products (in Million Tons CO2)
2013	21.85	14.13
2014	22.06	14.65
2015	21.16	13.77
2016	17.58	11.10
2017	16.92	10.67
2018	16.40	13.44
2019	14.87	12.01
2020	16.88*	13.86
2021	16.16	11.96
2022	20.45	11.80

*Note that reporting for 2020 Scope 3 GHG Emissions differs between reports. Scope 3 GHG emissions are listed as 16,883 thousand tons CO_2 in Sony Sustainability Report 2022 (Sony Group Corporation 2022) and 17,077 thousand tons CO_2 in 2021 (Sony Group Corporation 2021).

3.1.4 Whirlpool

In 2003, Whirlpool Corporation was the first appliance company to announce an emissions reduction target. More recently, in 2021 Whirlpool set net zero targets for their Scope 1 and 2 emissions for 2030, using the SBTi methodology. Whirlpool's stated global strategies for reducing Scope 1 and 2 emissions include progressing to fully renewable energy use in operations and manufacturing, increasing energy efficiency of plants through retrofitting, and investing in carbon removal endeavors and carbon

offsetting (Whirlpool Corporation 2021). In their 2022 ESG report, the company described how they achieved a 25% reduction in Scope 1 and 2 emissions from the year 2021 to 2022, and a total 45% reduction from baseline year 2016 to 2022 (Whirlpool Corporation 2023).

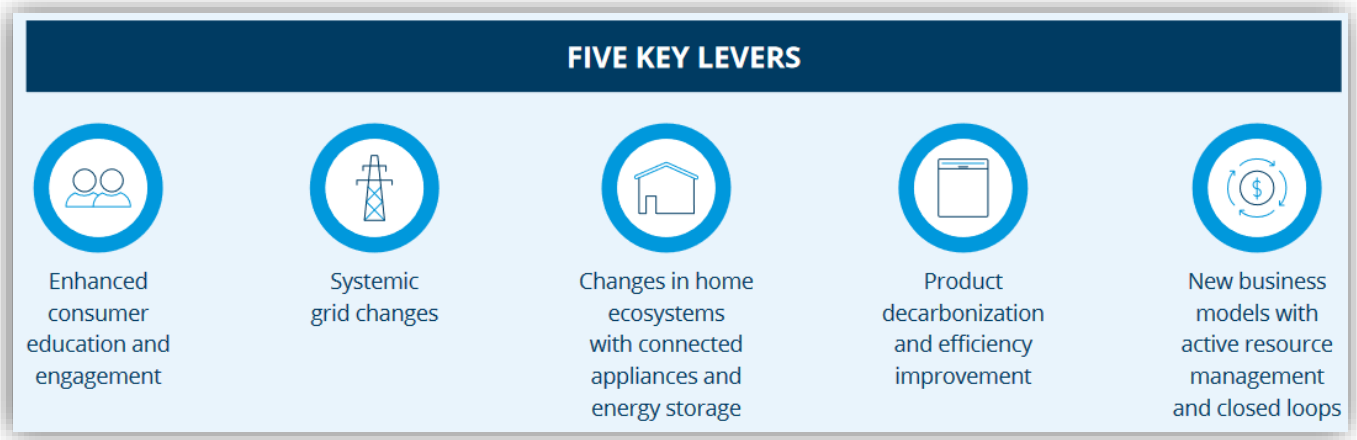
Table 10: Whirlpool Carbon Reduction Goals

Goal	Baseline Year	Target Date
Net zero in Scope 1 & 2 emissions	2016	2030
20% reduction in Scope 3 (specifically, Category 11) emissions	2016	2030

With regards to Scope 3 emissions, Whirlpool has set a target for a 20% reduction in Category 11 emissions for 2030 as compared to the baseline year of 2016. In their 2022 ESG report, the company stated that, "It is an even bigger challenge to advance sustainability in areas where we don't have 100% control, such as the upstream and downstream emissions included in scope 3." Reflecting these challenges, Whirlpool described its general Scope 3 reduction approach stating that the company will "continue to make innovative products that are resource efficient, work with our suppliers on more eco-efficient materials, collaborate with our trade customers in managing the end of life of the products, help our consumers use our appliances in the most efficient way and invest in renewable energy that helps improve the electrical grid" (Whirlpool Corporation 2023, 20).

More specifically, Whirlpool described five key approaches, or levers, as shown in Figure 3 below.

Figure 3: Whirlpool Corporation "Reducing Emissions from Our Products in Use: Five Key Levers"(Whirlpool Corporation 2023, 20)



Whirlpool's ESG report cited the example of highly efficient washers that use both less energy and water, such as the Whirlpool Xpert Eco top load washer model, as a strategy the company has taken to reduce Scope 3 emissions. ENERGY STAR products are not described explicitly within Whirlpool's product development actions for Scope 3 emissions reduction (ENERGY STAR products are solely mentioned within the ESG report appendix as a portion of total product revenue). To a lesser extent, Whirlpool's Scope 3 reduction strategy also explores alternatives to plastics within waste reduction efforts in manufacturing.

Whirlpool began disclosing Category 11 of Scope 3 emissions in their 2018 ESG report. It does not disclose complete Scope 3 emissions numbers.

Table 11: Whirlpool's Category 11 'Products in Use' Emissions*

Year	Category 11: Use of Sold Products (in Million Tons CO_2)
2018	76.2
2019	67.6
2020	61.4
2021	62.2
2022	53.3

*Whirlpool's general Scope 3 Emissions are not reported, only Category 11

3.1.5 Samsung

In 2022, Samsung developed and publicized their New Environmental Strategy, with mid- to long-term climate-related goals, as summarized in Table 12. These included reaching net zero Scope 1 and 2 emissions by 2050.

Table 12: Samsung Carbon Reduction Goals

Goal	Baseline Year	Target Date
Net zero in Scope 1 & 2 emissions	2022	2050
Improve energy efficiency of leading models of 7 major product categories by 30%	2019	2030
100% renewable energy	2030	2050

Samsung's Scope 1 target strategy requires electrifying corporate vehicles, and technological innovation to more efficiently treat the gases used in its semiconductor manufacturing processes to reduce their global warming potential and lower air pollution. Their Scope 2 target resulted in Samsung joining the RE100 commitment among corporations to use 100% renewable energy (Samsung Electronics 2023). Other related environmental and sustainability goals revolve around resource circulation, water reuse, carbon capture activities and technologies, and preventing e-waste.

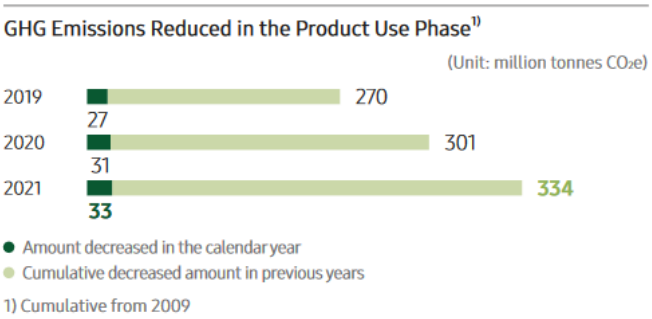
After its first year reporting results under the New Environmental Strategy, environmental groups including the New Climate Institute (NCI) and Greenpeace criticized Samsung for purchasing of renewable energy certificates, rather than directly generating or signing power purchase agreements for a greater portion of their renewable energy. NCI also questioned Samsung's claim that Scope 1 and 2 emissions were reduced by 59% between 2021 and 2022, arguing that a calculation approach based on local energy generation sources would result in only a 1.5% reduction (Eco-Business 2023).

As of the publication of its 2023 ESG report, Samsung did not have a comprehensive Scope 3 target. Instead, the company was "working to establish mid- to-long-term targets and develop specific tasks across diverse areas from supply chains to resource circularity and logistics" (Samsung Electronics 2023, 16). Samsung developed a Scope 3 emissions task force to set goals and develop a strategy to reduce emissions.

While it does not have an overarching Scope 3 goal, Samsung has set goals targeting the energy use of certain product types. The company seeks to improve the efficiency of leading models of monitors, air conditioners, PCs, washers, smartphones, refrigerators, and televisions by 30% by 2030, which would support the effort of reducing Scope 3 emissions (Samsung Electronics 2023). Samsung disclosed their Scope 3 emissions for the first time in their 2023 ESG report and does not yet specifically report emissions due to use of sold product (Category 11). Rather, the year-to-year "amount of GHG emissions

reduced in the product use phase" has been recorded since 2019 (see Figure 4 for Samsung's 2022 depiction) (Samsung Electronics 2023, 108).

Figure 4: Samsung GHG Emissions Reduced in Product Use (Corporate Sustainability Management Office, Global Public Affairs, Samsung Electronics 2022, 29)



Strategies to increase product efficiency listed in Samsung's 2023 ESG reports included the development of SmartThings AI Energy Mode across appliances, incorporation of ultra-low-power semiconductors to reduce energy use of devices with memory and data center parts, and use of high efficiency parts like compressors in products. Another aspect of Samsung's efforts to reduce Scope 3 emissions is training supplier partners on how to reduce GHG emissions and providing them consulting on the topic.

Samsung mentions ENERGY STAR products multiple times within their ESG report, noting the certification within a few highlighted, high efficiency products like the Viewfinity S8 monitor and mentioning elsewhere how Samsung received a recent ENERGY STAR partner of the year award. However, the report does not connect the sales and promotion of ENERGY STAR products to actions regarding product use emissions reduction.

3.1.6 Vizio Inc.

VIZIO lacks explicit Scope 1, 2, or 3 emissions targets, or related, supportive goals. Additionally, the American-owned and founded Vizio does not publish an annual ESG report or other summary of their carbon emissions and other environmental impacts. While it does not publish formal reports, VIZIO maintains a "Sustainability Overview" webpage (VIZIO, Inc. 2023). Under the Environmental Commitment subheading, the manufacturer primarily describes their commitment to promoting electronics recycling and preventing e-waste in landfills, which prevented 305 million pounds of electronics in landfills since 2014. EPA's Sustainable Materials Management (SMM) Challenge has rewarded VIZIO's landfill diversion efforts over the past years. Other manufacturers like Samsung, LG, and Sony have also recently received SMM Challenge awards and accreditation for reuse and recycling (OLEM US EPA 2023).

3.1.7 GE Appliances

GE Appliances has not publicly listed explicit Scope 1, 2, and 3 emissions goals. The company has set sustainability goals that will result in a reduction in greenhouse gas emissions, but these goals and actions are not connected to a public emissions reduction strategy, tied to a specific reductions target, or motivated by a resolution like the Science Based Targets initiative. For example, the company has committed to transitioning to lower global warming potential (GWP) refrigerants in products. Other environmental and sustainability-focused actions include utilizing more electric trucks to transport

merchandise, diverting waste from landfills, and implementing efficiency retrofits in facilities where appropriate (GE Appliances 2022a).

Table 13: GE Appliances Environment and Sustainability Related Goals

Goal	Baseline Year	Target Date
Transition to 100% of US-manufactured refrigeration products to low GWP refrigerants	2022	2025
Use 15% less energy to make each product at U.S. plants	2020	2026

More broadly, GE Appliances (based in China) has published a Corporate Citizenship Impact report since 2020, with an accompanying content index of reported figures. Within the report GE shares annual Scope 1 and 2 emissions. Scope 3 and its categorical emissions are not listed, nor is specific Scope 3 Category 11 use of sold product emissions. According to GE's 2022 Corporate Citizenship Content Index, "GE annually monitors their greenhouse gas emissions associated with Scope 1 and Scope 2 as defined by the Greenhouse Gas Protocol"; the report makes no mention of Scope 3 (GE Appliances 2022b, 10).

GE Appliances lists offering ENERGY STAR appliances as one of four "sustainable design practices" the company is using to "reduce our product lifecycle environmental impact," noting that its portfolio includes nearly 500 ENERGY STAR products. The other three strategies listed focus on shifting toward low GWP refrigerants in portable air conditioners, room air conditioners and dehumidifiers (GE Appliances 2022a, 18). Like other manufacturers, GE also describes the research and development of product features that promote energy efficiency, like their HCA Interface Specification 1.0 tool for home automation and appliance connectivity (GE Appliances 2022a).

3.2 Retailers

While there is some variation in the reported Scope 1 and Scope 2 emissions between the retailers included in this review, there is much wider variation in reported Scope 3 emissions (Table 14). In general, retailers that offer groceries and/or clothing tend to report higher Scope 3 emissions than other retailers and use of sold products is a smaller proportion of total Scope 3 emissions for those retailers.[7] This likely reflects the carbon intensity of the agricultural production that goes into food and clothing products, which generate limited emissions through their use.

Table 14: Retailer Reported Carbon Emissions, 2022

Company	Scope 1	Scope 2	Scope 3	Scope 3 as % of Total	Use of Sold Products	Use of Sold Products as % of Scope 3
	Million Metric Tons (MMT) CO_2 equivalent (CO_2e)				*MMT CO_2e*	
Best Buy	0.23	0.11	21.48	98%	21.45	100%
The Home Depot	0.60	0.96	3.70	70%	*Not Reported*	
Lowe's	0.44	1.03	163.68	99%	135.85	83%
Nationwide	*Not Reported*					
Amazon	13.40	2.89	54.98	77%	21.39[a]	39%

[7] Lowe's is an outlier in this regard, reporting much higher Scope 3 emissions than other retailers, and the cause of their higher reported emissions is not clear.

Costco	1.41	1.43	171.20	98%	74.50[b]	44%
Walmart	7.31	6.54	*Not Reported*			

[a] Includes corporate purchases and business travel as well as use of sold products; only includes Amazon-branded products.
[b] Includes end of life treatment of sold products as well as use of sold products.

Most of the retailers included in this review have set carbon reduction goals, with four of the six retailers setting goals seeking net zero or carbon neutrality. As part of these efforts, three retailers have set targets for 100% renewable energy use within their own facilities.

Table 15: Retailer Scope 1 and Scope 2 Goals

Company	Goal	Baseline Year	Target Date
Best Buy	75% reduction in Scope 1 & 2 emissions	2009	2030
	Carbon neutral	N/A	2040
The Home Depot	42% reduction in Scope 1 & 2 emissions	2020	2030
Lowe's	40% reduction in Scope 1 & 2 emissions	2021	2030
	Net zero	N/A	2050
Nationwide	*Not Reported*		
Amazon	100% renewable energy use	N/A	2030
	Net zero	N/A	2040
Costco	39% reduction in Scope 1 & 2 emissions	2020	2030
	100% renewable energy use	N/A	2035
Walmart	35% reduction in Scope 1 & 2 emissions	2015	2025
	65% reduction in Scope 1 & 2 emissions	2015	2030
	100% renewable energy use	N/A	2035
	Net zero	N/A	2040

Retailers' goals for Scope 3 carbon emissions were relatively consistent, with all four retailers with goals expressed as a percentage reduction targeting between 20% and 25% reductions, and all setting 2030 as a target date (Table 16).

Table 16: Retailer Scope 3 Goals

Company	Goal	Baseline Year	Target Year
Best Buy	20% reduction in carbon emissions from ENERGY STAR product categories	2017	2030
The Home Depot	$600 million in customer energy cost savings through use of energy saving products	2023	2026
	25% reduction in Scope 3 emissions from use of sold products	2020	2030
Lowe's	22.5% reduction in Scope 3 emissions	2021	2030
Nationwide	*Not Reported*		
Amazon	*Not Reported*		
Costco	20% reduction in Scope 3 emissions intensity	2020	2030
Walmart	Reduce, avoid, or sequester 1 billion metric tons of emissions in global value chain	2017	2030

Retailers participating in ESRPP described a wider range of strategies to reduce carbon emissions from the use of the products they sell than other retailers included in this review (Table 17). Amazon and Walmart's strategies focused on supplier engagement, including sharing resources and even providing financial incentives for suppliers to reduce their own emissions and increase product efficiency. Both

organizations have established initiatives – Amazon's Climate Pledge and Walmart's Project Gigaton – that suppliers or other business partners can join to access these resources.

Table 17: Retailer Strategies to Reduce Emissions from Use of Products Sold

Strategy	Best Buy	The Home Depot	Lowes	Nationwide	Amazon	Costco	Walmart
Dashboards to identify high opportunity products and track progress	X						
Engagement with vendors	X	X	X		X	X	X
Sales staff training	X						
Expanded electrification product offerings	X	X					
Promotion of efficient products	X	X	X				
Support electric grid decarbonization	X						
Energy efficiency buying guides for merchants			X				
"Road maps" for improvement by product group			X				
Strategies not reported				X			

Best Buy was the only retailer included in this review to explicitly list support for electric grid decarbonization as a strategy to reduce Scope 3 emissions.[8] The company's 2023 ESG report notes that it works with investor-owned utilities and policymakers to support less carbon-intensive power grids (Best Buy 2023). The Home Depot's ESG report also mentions that the company anticipates power grids will become less carbon intensive in the future, but does not suggest the company is taking any action related to power grid carbon intensity (The Home Depot 2023).

3.2.1 Best Buy

Best Buy was an early adopter of the SBTi's science-based targets. Consistent with the initiative's approach, it has set progressively more stringent targets, leading to carbon neutrality by 2040 (Table 18). Best Buy accelerated its target date to become carbon neutral to 2040 from an original target of 2050 as part of its participation in Amazon's Climate Pledge initiative.

Table 18: Best Buy Carbon Reduction Goals

Goal	Baseline Year	Target Date
75% reduction in Scope 1 & 2 emissions	2009	2030
Carbon neutral	N/A	2040

Best Buy uses the concept of the circular economy, developed by the Ellen MacArthur Foundation, as an overarching framework for its sustainability efforts. "Assorting and promoting products that are more sustainable" is one of the areas the company has defined as "highest impact" for achieving circular

[8] Scope 3 emissions from use products sold ultimately result from the electricity generated to power those products. As a result, lowering the carbon intensity of the electricity products use can be a strategy to reduce Scope 3 emissions, in parallel with reducing the amount of energy the products use through energy efficiency.

economy goals.[9] To that end, Best Buy's Scope 3 reduction efforts focus entirely on reducing carbon emissions from use of products sold. Best Buy seeks to reduce carbon emissions from ENERGY STAR product categories by 20% relative to a 2017 baseline by 2030, resulting in $5 billion in customer energy costs over the lifetime of the products. Through 2022, Best Buy reported it had achieved nearly $4 billion in customer energy cost savings.

Steps Best Buy has taken to achieve its goals of reducing emissions due to use of products sold include:

- **Developing a reporting tool to identify opportunities:** Sustainability staff developed this dashboard to identify products with the highest contribution to overall carbon emissions and present that information to internal stakeholders and vendors to identify ways to reduce those emissions.[10]
- **Engaging with vendors:** According to Best Buy's 2022 ESG report, the information presented in its reporting tool led to a conversation with a vendor in 2022 who subsequently certified "most of their products as ENERGY STAR" and increased their focus on energy efficiency in product design. This change notably decreased Best Buy's carbon emissions from use of products sold (Best Buy 2022).
- **Training sales staff on ENERGY STAR:** Since 2011, Best Buy has offered e-learning modules to inform sales staff about ENERGY STAR products, their benefits, how to identify them, and how to help customers find them. Over the past 12 years, employees have taken the training more than 300,000 times (Best Buy 2023).
- **Expanding product offerings focused on electrification:** In 2023, Best Buy expanded its assortment of electric bikes and scooters, and electric lawnmowers, snowblowers, and other yard equipment that might otherwise have been powered by gasoline (Best Buy 2023).
- **Promoting efficient products:** Best Buy has a Sustainable Living shopping page on its website that features ENERGY STAR products. It also works with electric utilities to offer customers rebates, including instant rebates, for efficient products and maintains an online Rebate Finder tool (Best Buy 2023).
- **Advocating for a less carbon-intensive electric grid:** Lowering the carbon emissions associated with electricity production reduces both Scope 2 and Scope 3 emissions by decreasing the emissions associated with every kilowatt hour of electricity used in Best Buy facilities (Scope 2) or by the products Best Buy sells (Scope 3). As a result, Best Buy works with investor-owned utilities and policymakers to support less carbon-intensive power grids (Best Buy 2023).

3.2.2 The Home Depot

The Home Depot has set science-based carbon reduction targets, which it submitted to SBTi for approval in 2022. Its recent goals define Scope 1, 2, and 3 reduction targets for 2030, as described in Table 19. In addition to these targets, The Home Depot seeks to meet 100% of the electricity needs for its facilities

[9] The concept of the circular economy focuses on viewing products as part of a larger cycle, rather than single-use items. Additional details are available at: https://www.ellenmacarthurfoundation.org/topics/circular-economy-introduction/overview

[10] These dashboards, described in Best Buy's 2022 ESG Report, appear very similar to dashboards sustainability staff previously described in presentations to ESRPP program sponsors as tools to inform merchants and other stakeholders about ESRPP incentives.

from renewable sources by 2030 and convert 90% of the forklifts in its distribution centers to hydrogen power by the end of 2029 (The Home Depot 2023).

Table 19: The Home Depot Carbon Reduction Goals

Goal	Baseline Year	Target Date
42% reduction in Scope 1 & 2 emissions	2020	2030
25% reduction in Scope 3 emissions from use of sold products	2020	2030

As noted in Table 19, The Home Depot's Scope 3 emissions reduction goals focus on emissions from use of products sold. The company acknowledges this in its 2023 ESG report, writing that "We understand our biggest opportunity to create a positive impact on the environment comes from the products that we sell." The Home Depot has set interim goals related to energy use of products sold, including helping customers save $600 million in energy costs through the use of "energy-saving" products sold between 2023 and 2026 (The Home Depot 2023).

The Home Depot also targets lawn equipment as a source of Scope 3 emissions reduction, setting a target to achieve 85% of push mower and handheld outdoor lawn equipment sales powered by rechargeable batteries rather than gasoline. The company reports this will result in a reduction of 2 million metric tons of carbon emissions (The Home Depot 2023).

Beyond expanding its electric lawn equipment offerings, The Home Depot focuses on its Eco Actions website as a strategy to increase sales of ENERGY STAR products. It describes the website as a way to both recognize vendors for their actions to make products more sustainable and a way to educate and promote efficient products to customers (The Home Depot 2023). The ENERGY STAR program also highlighted the Eco Actions website, along with other ENERGY STAR-focused marketing efforts, in naming The Home Depot as a Retailer Partner of the Year in 2022 (U.S. Environmental Protection Agency, n.d.). In addition to the Eco Actions website, The Home Depot's 2023 ESG report mentions working with suppliers to offer customers more efficient and sustainable products but does not go into specifics. The report also notes that the company anticipates the electric grid will become less carbon intensive in the future, which will help to reduce Scope 3 emissions (The Home Depot 2023).

3.2.3 Lowe's

In December 2022, Lowe's updated their climate commitment to meet SBTi's specifications, creating a net zero emissions goal for 2050 (Lowe's Companies, Inc. 2022). Their emissions reduction goals have supplemental specific Scope 1, 2, and 3 targets, as displayed in

Table 20. Prior to the 2022 update, Lowe's did not have a total net zero goal or a specific Scope 3 reduction goal, although the company reported achieving reductions in Scope 1 and 2 emissions since 2016 and a reduction in total energy consumed from 2021 to 2022 (Lowe's Companies, Inc. 2020).

Table 20: Lowe's Carbon Reduction Goals

Goal	Baseline Year	Target Date
40% reduction in Scope 1 & 2 emissions	2021	2030
22.5% reduction in Scope 3 emissions	2021	2030
Net zero carbon emissions	2022	2050

Lowe's has been reporting Scope 3 emissions since 2021 and also distinctly reports Category 11 emissions (use of sold products) (Table 21).

Table 21: Lowe's Scope 3 Emissions 2021-2022

Year	Scope 3 GHG Emissions, All (in Million Tons CO2)	Category 11: Use of Sold Products (in Million Tons CO2)
2021	178.75	152.09
2022	163.68	135.85

Lowe's general strategy towards 2050 net zero (encompassing Scope 1, 2, and 3) consists of three parts: collaborating to reduce suppliers' upstream emissions, improving the energy efficiency of company operations, for example by investing in renewable energy, and continuing their expansion of sustainable products and services for customers, including promoting ENERGY STAR certified products (Lowe's Companies, Inc. 2023, 20).

Focusing on Scope 3, Lowe's states in its 2022 Corporate Responsibility Report that product lifecycles are the biggest contributor to emissions, and that they intend to create plans for reducing emissions in their product portfolio and assist suppliers in tracking and reducing emissions. Lowe's Corporate Responsibility Report lists four specific strategies to achieve the company's carbon reduction goals, two of which focus directly on increasing the efficiency of products sold:

- Sustainable buying guides to help "merchandising teams embed sustainability criteria into product selection decisions."
- Net-zero emissions roadmaps to set specific emissions reduction targets for each product type that will support the company's overall emissions reduction goals. The report notes that Lowe's will collaborate with suppliers as part of this effort to help them track and reduce emissions, noting that 86% of the company's top 50 suppliers by cost of goods sold have set sustainability goals as of 2023 (Lowe's Companies, Inc. 2023, 33).

The other specific plans noted in Lowe's 2022 Corporate Responsibility Report involve reducing the use of Styrofoam and plastic film in the packaging of private brand products and creating a reference guide for suppliers on sustainable packaging. In addition to content targeted to their in-house merchandising teams, Lowe's also hosts rebate centers and energy efficiency guides online to assist customers in purchasing high efficiency items (Lowe's Companies, Inc. 2023, 32).

3.2.4 Nationwide Marketing Group

Nationwide Marketing Group does not report Scope 1, 2, or 3 emissions targets or related environmental goals. The company does not publish an annual ESG or corporate responsibility report, or a summary of their carbon emissions and environmental impacts. Nationwide does not maintain a sustainability or environmental impact webpage.

3.2.5 Amazon

Table 22 lists Amazon's current carbon reduction goals. In 2019, Amazon created their Climate Pledge, committing to net zero emissions by 2040 and indicating their involvement in the SBTi (Amazon 2019).

Table 22: Amazon Carbon Reduction Goals

Goal	Baseline Year	Target Date
Net zero carbon emissions	2019	2040
100% renewable energy	2014	2030

Amazon stated an intention to share draft emissions reduction targets with SBTi for review in 2020 but has not yet done so (Day 2020). Amazon's current publicly-stated strategy and goals related to carbon emissions center on the company's plans to expand EV use in delivery (for example, with the use of Rivian electrical vans and other EVs), a $2 billion dollar investment in their Climate Pledge Fund which supports startup level decarbonization technology, and procuring 100% renewable energy to move away from fossil fuels (Amazon 2022a).

In 2019, Amazon committed to making half of shipments net zero carbon emissions by 2030 through an initiative called Shipment Zero. The company dropped this aspect of their climate pledge in 2023, restating their commitment to reaching net zero in 2040 (Barr 2023).

In August 2023, SBTi removed Amazon as one of the companies listed on their dashboard with a commitment against climate change (White, Day, and Bloomberg 2023). Amazon described this as an "extension" permitted to create goals approved by SBTi's methodology (Amazon Staff 2023).

Amazon has reported dramatic decreases in emissions in recent years, such as a 29% drop in their Scope 2 emissions from 2021 to 2022 (Amazon 2022a, 12). The company has gone from 42% renewable energy use in 2019 to 90% in 2022, with an ultimate goal of reaching 100% in 2030 (Amazon 2019).

Amazon's 2022 sustainability report went into more detail on the company's value chains emissions reduction actions than prior reports had done. These statements were not tied to a Scope 3 emission reduction goal, nor did they describe specific strategies that may impact product use emissions. The company reported that it would provide suppliers with tools and products to track emissions in support of emissions reduction efforts, select partners/suppliers interested in decarbonization and carbon-free electricity, and require supplies to set carbon reduction goals and share carbon emissions information with the company.

Amazon has reported Scope 1, 2 and 3 emissions since 2018, and the 2022 sustainability report listed a reduction in Scope 3 emissions. Amazon's Scope 3 emissions reporting provides limited breakouts on Scope 3 emissions by category. For example, use of sold product (also known as Category 11) emissions are reported in the same line item as corporate purchases and business travel, rather than as a distinct category. Amazon also only calculates emissions from use of products sold for Amazon-branded products (Amazon 2022b), which, according to company testimony, account for 1% of sales ("Questions for the Record for Amazon Following the July 29, 2020, Hearing of the Subcommittee on Antitrust, Commercial, and Administrative Law" 2020).

3.2.6 Costco Wholesale Corporation

Costco recently increased its emissions reduction goals in response to shareholder pressure. Costco's 2021/2022 Climate Action Plan listed a 20% Scope 1 and 2 emissions reduction target but did not include a Scope 3 target.[11] In 2022, an ESG-focused investment group called Green Century filed a proposal at the company's Annual General Meeting with shareholders asking that the company "adopt short, medium, and long-term science-based greenhouse gas emissions reduction targets, inclusive of emissions from its full value chain, in order to achieve net-zero emissions by 2050 or sooner and to effectuate appropriate emissions reductions prior to 2030" (Segal 2022). Green Century noted that 98% of Costco's emissions came from Scope 3. Costco's board recommended that shareholders should vote

[11] Although the company produced a Climate Plan in the past few years, it did not publish an annual, public facing ESG report or similar document.

against the proposal, stating that the company's existing Climate Action Plan would balance emissions reductions with the company's business needs (Sullivan 2021). The resolution passed with 70% shareholder support (Green Century Funds 2022). Later in 2022, 13,000 consumers signed a petition requesting Costco take timely action in response to the resolution (Environment America Media Releases 2022).

In December 2023, Costco revised its Climate Action Plan in response to the resolution. The Scope 1 and 2 reduction target increased from 20% to 39%, and the company developed a Scope 3 target of reducing emissions intensity by 20% by 2030 (Costco Wholesale Corporation 2023). While the resolution proposed net zero targets that are consistent with SBTi goals, Costco's plan adjustments do not reach carbon neutrality and do not follow SBTi methodology. Costco's 2023 Climate Action Plan acknowledges that the listed goals are not science-based targets, but states that the company will "continue to utilize SBTi's guidance" (Costco Wholesale Corporation 2023, 2). Prior to the 2021/2022 Climate Action Plan, Costco did not publish information on their Scope 1, 2, and 3 emissions, although the company disclosed emissions data to CDP beginning in fiscal year 2020.

Table 23: Costco Carbon Reduction Goals

Goal	Baseline Year	Target Date
39% reduction in Scope 1 & 2 emissions	2020	2030
20% reduction in Scope 3 emissions intensity*	2020	2030
100% renewable energy	2022	2035
30% reduction in use of refrigerants	2022	2030

*"The Scope 3 Standard states that companies may report emissions intensity metrics to avoid misinterpretation of emission results as more durable products with longer lifetimes would at first appear to have higher lifetime use-phase emissions" (Greenhouse Gas Protocol and Carbon Trust 2013, 160).

Costco's current reporting of Scope 3 emissions divides the Scope 3 categories into upstream, downstream, and value chain, combining some categories (Table 24). A majority of Costco's Scope 3 emissions come from upstream sources, potentially reflecting the company's grocery and clothing businesses, which rely on products that can have significant carbon emissions in production (for example, due to agriculture) but result in little or no emissions through product use. Downstream emissions, which include emissions from the use of sold products, account for 43% of Costco's total Scope 3 emissions.

Table 24: Costco Scope 3 Emissions Breakdown (Costco Wholesale Corporation 2023, 12)

Year	Scope 3 GHG Emissions, All (in Million Tons CO2)	Category 11: Use of Sold Products & Category 9: Downstream Transportation & Distribution (in Million Tons CO2)
2020	141.81	56.77
2021	155.28	63.59
2022	171.27	74.50

Costco has developed a five-pillared "Scope 3 Action Plan" to achieve its new targets:

- Regenerative/deforestation-free agricultural practices: supporting suppliers "in minimizing risk of sourcing from deforestation areas;"
- Sustainable packaging: reusing, when possible, lightweight packaging and recycling;
- Supporting suppliers in using, creating, or procuring clean energy;

- Sustainable livestock: working with livestock experts to "reduce the intensity" of animal agriculture emissions; and
- Energy efficient items: increasing supplier energy efficiency and "leveraging existing energy efficiency certifications (e.g. ENERGY STAR)" (Costco Wholesale Corporation 2023, 9–11).

Emissions related to Costco's fuel sales are subject to a separate strategy, given that an estimated 20% of Costco's Scope 3 emissions come from its gas stations. In response to fuel emissions, the company mentions the possibility of EV charging for members, procuring lowest carbon intensity fuels, and buying from refineries with cleaner production methods.

3.2.7 Walmart

Walmart has been an early adopter of climate-based goals and, in 2016, was the first retailer to set a science-based target for emissions reduction. In 2020, Walmart updated its goal to zero carbon emissions (the first retailer to do so without the use of carbon offsets), in alignment with the science-based target of a 1.5-degree Celsius trajectory by 2040. The company has also set intermediate Scope 1 and 2 emissions reduction targets for 2025 and 2030 (see Table 25).

Table 25: Walmart Carbon Reduction Goals

Goal	Baseline Year	Target Date
35% reduction in Scope 1 and 2 emissions	2015	2025
65% reduction in Scope 1 and 2 emissions	2015	2030
Reduce, avoid, or sequester 1 billion metric tons of emissions in global value chain through Project Gigaton (Scope 3 emissions)	2017	2030
100% renewable energy	2005	2035
Net zero carbon emissions	2020	2040
Transition to low-impact refrigerants for cooling in stores, clubs, data centers and distribution centers	2020	2040

Walmart's environmental commitment goes back to 2005, when the company set a goal of 100% renewable energy use. Their current net zero strategy has four prongs, mainly addressed to Scope 1 and 2: (1) electrifying their company's transportation; (2) transition to low environmental impact refrigerants in their facilities; (3) increased use and scale of renewable energy; and (4) using less combustible stationary fuels at facilities (Walmart, Inc., n.d.).

Walmart does not have an explicit Scope 3 reduction goal, nor does the company disclose a calculation of its Scope 3 emissions. Walmart has cited the difficulty estimating carbon contributions in its value chain from numerous suppliers to explain its lack of explicit Scope 3 reduction goals and reporting. According to The New York Times, Walmart has estimated that 95% of their total carbon emissions come from the supply chain (Corkery and Creswell 2021).

To address Scope 3 emissions, Walmart created an initiative called Project Gigaton that set a greenhouse gas goal of one gigaton emissions avoided from their value chain by 2030. The program recruits, incentivizes, and helps suppliers set goals and measure and report their emissions (and their reductions) among the focal areas of packaging, product use, energy use, deforestation, waste, and sustainable agriculture (Walmart, Inc. 2023b). Suppliers who successfully follow the initiative's requirements can be featured and recognized in Walmart's marketing and are eligible for financial incentives like discounts on trade financing (Walmart, Inc. 2021). Over 4,500 suppliers have signed up

for Project Gigaton since 2017. The company estimates that their participation has brought Walmart three-quarters of the way to the program goal of one gigaton (Walmart, Inc. 2023a).

4. Conclusions and Recommendations

Conclusion 1: Retailers participating in ESRPP have demonstrated a stronger focus on product energy consumption as a strategy to reduce Scope 3 emissions than other retailers included in this review. The ESRPP retailers cited a variety of specific strategies for reducing product energy consumption, ranging from dashboards to product roadmaps to promotion of efficient products. In contrast, while other retailers acknowledged increasing product efficiency as a way to address Scope 3 emissions, they did not cite specific strategies beyond engaging with vendors to support development of efficient products. To some extent, ESRPP retailers' engagement with ESRPP may reflect differences between their business models and those of the other retailers included in the review. For example, the Scope 3 emissions associated with groceries, which can have significant carbon emissions in the agricultural production process but few, if any, emissions in the use phase, are very different from the emissions associated with appliances. Nonetheless, through their participation in the program, ESRPP retailers have internal staff focused on tracking and promoting product efficiency and have worked to build internal relationships and infrastructure (like product dashboards) to support efforts to increase product efficiency. These efforts translate easily from a focus on ESRPP products to Scope 3 emissions reductions more broadly.

- **Recommendation: It may be valuable to develop case studies or sharable resources based on ESRPP retailers' experience** if NEEA chooses to engage with non-participating retailers. These non-participating retailers may need to build the internal structures and relationships needed to focus attention on increasing the efficiency of available products. If participating retailers are willing to share resources they have developed or be the subjects of case studies, these resources may help advance non-participating retailers' efforts to increase product energy use.

Conclusion 2: Retailer and manufacturer efforts to reduce emissions from products sold go beyond increasing the energy efficiency of available products. For example, multiple organizations included in this review listed support for decarbonization of the electric grid as a strategy to reduce Scope 3 emissions, recognizing that a less carbon-intensive grid would reduce emissions from products sold. Large consulting firms also recommend that companies become involved in regulatory activity related to emissions reduction and reporting so they can play an active role in shaping the regulation. While the sources reviewed for this research did not mention it directly, there may be an opportunity to extend this logic to encourage retailers to become involved in ENERGY STAR specification and federal standard revision processes. Assuming their emissions calculation approaches are able to capture the savings, more stringent ENERGY STAR specifications should provide retailers with greater Scope 3 reductions for each qualified product sold, while increased federal standards should reduce Scope 3 emissions across the market as a whole.

- **Recommendation: NEEA should work with retailers, the EPA ENERGY STAR program, and potentially other relevant stakeholders to ensure that methodologies for calculating emissions reductions from sales of efficient products align with program efforts.** For example, calculation approaches should provide increased emissions reductions for sales of higher-tier products. They should also allow retailers and manufacturers to report emissions reductions resulting from updates to ENERGY STAR specifications and federal standards.

- **Recommendation: NEEA should leverage the potential emissions reductions to engage retailers in support of ENERGY STAR specification and federal standard updates.** As noted above, increasing the stringency of these specifications could result in significant Scope 3 emissions reductions for retailers. Retailers could also provide valuable data on product availability and market share to support adoption of more stringent specifications and standards.

Conclusion 3: Manufacturers' global perspectives and, in some cases, their position within larger conglomerates, influence their approach to Scope 3 emissions reduction efforts. The manufacturers included in this review produce products for global markets. With multiple efficiency specifications and standards to consider around the world, relatively few mentioned ENERGY STAR directly in their approach to reducing Scope 3 emissions related to product use. Manufacturer ESG reports indicated, however, that stringent efficiency standards in different parts of the world can drive development of efficient products. Multiple manufacturers were also planning for increased product efficiency through development of product-specific roadmaps.

- **Recommendation: NEEA should focus on supporting increased federal standards as a way to drive manufacturers' focus on product efficiency.** It may be difficult for the program to engage with global manufacturers directly. However, findings suggest that these manufacturers are tracking efficiency standards around the world.

Conclusion 4: Retailers' and manufacturers' desire to reduce Scope 3 emissions from upstream sources could create opportunities for commercial and industrial efficiency programs. Engagement with suppliers to encourage them to track and reduce their own carbon emissions was one of the most commonly reported strategies for reducing Scope 3 emissions among both retailers and manufacturers. There may be an opportunity for NEEA to leverage this engagement to encourage participation in the commercial and industrial efficiency programs that NEEA and its partner organizations offer. For example, if a supplier to one of the retailers or manufacturers listed in this review is located in the Northwest and participates in a NEEA commercial HVAC program or a utility-sponsored Strategic Energy Management (SEM) program, the resulting carbon reductions would benefit the retailer or manufacturer's upstream Scope 3 reduction targets.

- **Recommendation: NEEA should frame its commercial and industrial program offerings and those of its partner utilities as a resource for retailers and manufacturers seeking to engage with vendors to reduce their carbon emissions.** In this way, retailers and manufacturers could work as a source of referrals for commercial and industrial programs. Retailers and manufacturers could also provide additional motivation for their vendors to participate through their existing engagement efforts, like shared promotion and, potentially, financial incentives.

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