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Research/Review

Sustainable Practices and Their Impacts in the Pharmaceutical Supply Chain: Insights from Top Five Companies

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	Abstract
Published on: 16 Jan 2025	Sustainability has become a critical focus in the pharmaceutical industry, driven by regulatory requirements, market demands and corporate social responsibility. This paper investigates sustainable practices adopted by five leading pharmaceutical companies: Pfizer, Johnson & Johnson, AbbVie, Merck & Co., and Roche. The study explores their impacts on operational efficiency, environmental performance and competitive advantage through a detailed analysis of procurement, logistics, waste management and manufacturing processes. By examining these industry leaders, we identify key drivers, barriers and future trends in pharmaceutical supply chain sustainability. The research reveals significant progress in areas such as supplier engagement, transportation optimization, waste reduction and renewable energy adoption. A conceptual framework is proposed to illustrate the integration of sustainable practices, their impacts and feedback mechanisms in the pharmaceutical supply chain. This study offers valuable insights for advancing sustainability in global supply chains and provides a roadmap for pharmaceutical companies seeking to enhance their environmental performance while maintaining operational efficiency and competitive advantage.
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2025 All rights reserved.  Creative Commons Attribution 4.0 International License.	Keywords: Pharmaceutical industry, sustainability, supply chain management, environmental performance, operational efficiency, corporate social responsibility, waste management, renewable energy, procurement practices, logistics optimization.

INTRODUCTION

The pharmaceutical industry is a cornerstone of global healthcare, responsible for ensuring access to life-saving medicines. However, its supply chains are resource-intensive, with significant environmental footprints. Growing societal expectations and strict regulatory requirements have necessitated the adoption of sustainable practices across the pharmaceutical supply chain. This research examines how five leading pharmaceutical companies - Pfizer, Johnson & Johnson, AbbVie, Merck & Co., and Roche - address sustainability challenges and seize opportunities to enhance their operations and reputations.

Sustainability in the pharmaceutical industry has gained momentum in recent years, with particular emphasis on reducing environmental footprints and enhancing operational efficiencies. The industry is increasingly being held accountable for its environmental impact, with recent studies showing that the pharmaceutical sector's pollution emission intensity is almost 55% higher than that of car factories and the automation industry [1]. This has led to increased pressure from multiple stakeholders, including governments, regulatory bodies and clients to focus on sustainability [1].

The pharmaceutical supply chain involves complex, interlinking processes that must address all three pillars of sustainability: governance, social issues, and environmental sustainability [1]. Key sustainability challenges include environmental impacts such as energy use, greenhouse gas emissions, and water consumption as well as ethical concerns around the sourcing and distribution of medicines and social impacts such as labor practices and human rights [1].

This study aims to investigate sustainable practices adopted by leading pharmaceutical companies, exploring their impacts on operational efficiency, environmental performance, and competitive advantage. Through a detailed analysis of procurement, logistics, waste management, and manufacturing processes, we seek to identify drivers, barriers and future trends in pharmaceutical supply chain sustainability. By examining industry leaders, this research offers valuable insights for advancing sustainability in global supply chains and provides a roadmap for pharmaceutical companies seeking to enhance their environmental performance while maintaining operational efficiency and competitive advantage.

Objectives of the Study

The primary objectives of this research are:

1. To investigate and analyze sustainable practices adopted by five leading pharmaceutical companies: Pfizer, Johnson & Johnson, AbbVie, Merck & Co., and Roche.
2. To explore the impacts of these sustainable practices on operational efficiency, environmental performance, and competitive advantage in the pharmaceutical supply chain.
3. To identify key drivers and barriers influencing the implementation of sustainable practices in the pharmaceutical industry.
4. To develop a conceptual framework illustrating the integration of sustainable practices, their impacts, and feedback mechanisms in the pharmaceutical supply chain.

By addressing these objectives, this study aims to offer valuable insights for pharmaceutical companies seeking to enhance their environmental performance and provide a roadmap for implementing sustainable practices across their supply chains.

Research Methodology

- I. **Companies Selection:** This study examines the environmental sustainability efforts of five prominent pharmaceutical companies and these were selected from among the industry's top performers in 2023/2024. The chosen entities - Pfizer, Johnson & Johnson, AbbVie, Merck & Co., and Roche - have distinguished themselves through their high rankings on esteemed sustainability indices such as the Corporate Knights 2024 Global 100 and Barron's 100 Most Sustainable US Companies 2024, as well as favorable assessments from Sustainalytics [11]. These organizations were identified for analysis based on their pioneering roles in implementing sustainable practices, the depth and breadth of their publicly available sustainability information and their substantial influence on global pharmaceutical supply networks.
- II. **Data Collection:** To gather comprehensive and reliable data on the sustainable supply chain practices of the selected companies, a multi-source approach was adopted. The primary sources of information included annual reports, sustainability reports, and impact reports published by the companies themselves. Additionally, ESG (Environmental, Social, and Governance) ratings from reputable agencies were analyzed and official statements such as press releases and policy documents were examined. The study also incorporated information from credible news articles and industry publications for third-party perspectives. The data collection focused on procurement, logistics, waste management and manufacturing, paying specific attention to initiatives, performance metrics, challenges, and strategies. This approach aims to provide a holistic and accurate picture of sustainable practices in the pharmaceutical supply chain and identify trends, challenges and opportunities for future development.

Literature Review

Sustainable supply chain management (SSCM) has gained significant attention in the pharmaceutical industry due to increasing regulatory pressures, stakeholder expectations and the need for environmental stewardship. A comprehensive review of existing literature reveals several key themes and practices in pharmaceutical SSCM:

Sustainable Procurement: Prioritizing suppliers committed to sustainability has become crucial in pharmaceutical SSCM. Seuring and Müller (2008) highlight that leading companies are increasingly selecting suppliers based on environmental and social criteria in addition to traditional factors like cost and quality [2]. This approach not only reduces the overall carbon footprint but also fosters collaborative efforts throughout the supply chain.

Green Logistics: The transition to more environmentally friendly transportation methods has emerged as a significant trend. Ahi and Searcy (2013) note that pharmaceutical companies are optimizing their logistics networks to reduce carbon emissions, with many shifting from air to ocean freight for long-distance transportation [3]. This change not only decreases emissions but also optimizes transportation networks, leading to improved operational efficiency.

Waste Management: Implementing circular economy initiatives to minimize waste is a growing focus in the industry. Veleva et al. (2017) found that leading pharmaceutical companies are adopting strategies to reduce, reuse and recycle materials throughout their supply chains [4]. These efforts align with the broader goal of reducing the industry's environmental footprint.

Energy-Efficient Manufacturing: The adoption of renewable energy sources is rapidly increasing in pharmaceutical manufacturing. According to Galitsky et al. (2008), pharmaceutical manufacturing plants in the U.S. spend nearly \$1 billion annually on fuel and electricity to keep their facilities running [5]. This significant energy expenditure has driven the industry to explore various energy-efficient technologies and practices. This shift not only reduces greenhouse gas emissions but also contributes to long-term cost savings and energy security.

Transparency and Traceability: Beske-Janssen et al. (2015) emphasize the importance of supply chain visibility in achieving sustainability goals [6]. Advanced technologies like blockchain are being explored to enhance traceability and accountability throughout the pharmaceutical supply chain, addressing both environmental and safety concerns.

Stakeholder Engagement: Carter and Rogers (2008) argue that collaboration across the supply chain ecosystem is crucial for driving sustainable practices [7]. Engaging with suppliers, manufacturers, distributors, and regulators fosters partnerships that can address sustainability challenges more effectively.

Continuous Improvement and Innovation: Pagell and Wu (2009) stress the importance of ongoing innovation in SSCM [8]. This includes embracing a culture of sustainability-driven innovation, encouraging employees to identify improvement opportunities and exploring emerging technologies.

Recent studies have shown that adopting green supply chain practices can enhance return on investment, reduce costs, improve sales and boost corporate performance. However, implementing these practices is not without challenges. High implementation costs, regulatory complexity and technological limitations remain significant barriers.

Despite these challenges, the pharmaceutical industry is making significant strides in sustainability. Companies are setting ambitious targets to reduce greenhouse gas emissions, optimizing manufacturing and distribution processes and responsibly sourcing energy, water, and raw materials [9]. The industry is also investing in research and development to discover new, environmentally friendly processes and materials, including biodegradable packaging materials and green chemistry techniques [9].

As the pharmaceutical sector continues to evolve, the integration of sustainability into supply chain management practices is becoming increasingly critical. By adopting these practices, pharmaceutical companies can minimize their environmental impact, uphold social responsibility and ensure economic viability while delivering high-quality care to patients around the world.

Framework Development

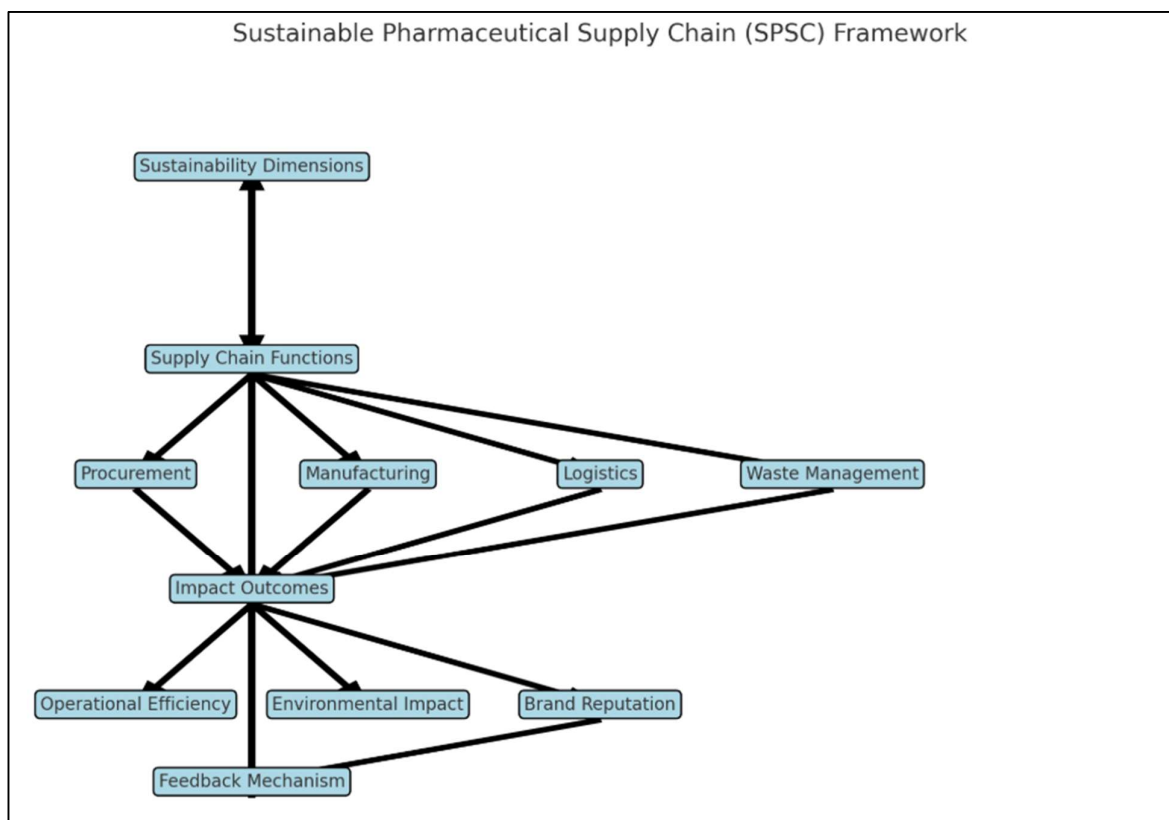


Figure 1: Sustainable Pharmaceutical Supply Chain (SPSC) Framework

The Sustainable Pharmaceutical Supply Chain (SPSC) Framework illustrates the integration of sustainability dimensions into pharmaceutical operations, emphasizing the interconnections between various components and their impacts. This framework consists of four key layers that demonstrate how sustainable practices influence organizational outcomes:

Sustainability Dimensions: The framework begins with sustainability dimensions at the top level, representing the overarching principles that guide sustainable practices in the pharmaceutical industry. These dimensions inform and influence all subsequent layers of the framework.

Supply Chain Functions: The second layer identifies four critical supply chain functions:

- **Procurement:** Focusing on sustainable supplier selection and engagement
- **Manufacturing:** Emphasizing energy-efficient processes and renewable energy adoption
- **Logistics:** Incorporating green transportation and distribution methods
- **Waste Management:** Implementing circular economy principles and waste reduction strategies

Impact Outcomes: The framework demonstrates how these supply chain functions directly influence three key impact areas:

- **Operational Efficiency:** Measuring improvements in resource utilization and cost reduction
- **Environmental Impact:** Assessing reductions in greenhouse gas emissions and waste
- **Brand Reputation:** Evaluating enhanced market position and stakeholder trust

Feedback Mechanism: The framework incorporates a feedback loop that enables continuous improvement through monitoring, evaluation, and adjustment of sustainable practices. This mechanism ensures that impact outcomes inform and refine future sustainability initiatives across all supply chain functions.

The bidirectional arrows in the framework represent the dynamic interactions between different components, highlighting how improvements in one area can positively influence others. For example, enhanced waste management practices can simultaneously improve operational efficiency and environmental impact, while also strengthening brand reputation.

This framework serves as a comprehensive tool for pharmaceutical companies to assess, implement, and improve their sustainable supply chain practices. It provides a structured approach to understanding how various sustainability initiatives contribute to overall organizational performance and environmental stewardship.

Case Descriptions

1. Pfizer

Pfizer has integrated sustainability into its supply chain through comprehensive initiatives across procurement, logistics, manufacturing, and waste management. Over 51% of Pfizer's suppliers have committed to science-based emission reduction targets, fostering collaborative efforts to reduce carbon footprints. Transitioning shipments from air to ocean freight has significantly enhanced operational efficiency, with a reduction of 50,000 metric tons of CO₂ emissions in 2022 alone. The company's energy-efficient manufacturing processes now utilize 10% renewable electricity, aiming for 100% by 2030. Additionally, Pfizer's circular economy practices, such as reusable shipping containers, have reduced packaging waste by 90%. Barriers include high costs and regulatory hurdles, while strong leadership commitment and global partnerships serve as key drivers for progress. These efforts have bolstered Pfizer's brand reputation as a sustainability leader.

2. Johnson & Johnson

Johnson & Johnson prioritizes sustainable procurement, with 50% of its suppliers committed to emission reduction targets. The company has optimized its logistics network by transitioning to efficient shipping methods, significantly reducing operational costs and environmental impacts. Waste management initiatives have led to a 23% reduction in Scope 1 and 2 emissions since 2021, while energy-efficient manufacturing processes achieved 87% renewable energy usage in 2023. Notably, the company reached 100% renewable energy in Europe, the U.S., and Canada. Johnson & Johnson also leads in recycling medical devices, exemplifying circular economy principles. Despite challenges like implementation complexity, the company's proactive policies and investments in renewable energy are key drivers. These practices enhance operational efficiency, align with global climate goals, and strengthen brand credibility.

3. AbbVie

AbbVie demonstrates a strong commitment to sustainability, engaging 65% of its suppliers in emission reduction initiatives. By reducing transportation emissions by 26% in 2023, the company has enhanced logistical efficiency and minimized its carbon footprint. Comprehensive waste management strategies have significantly increased recycling rates, while manufacturing operations now derive 55% of energy from renewable sources. AbbVie's redesign of products for recyclability highlights its circular economy approach. Barriers such as high technology costs are offset by leadership vision and consumer demand for greener products. These efforts not only improve environmental performance but also elevate AbbVie's market standing and operational efficiency.

4. Merck & Co.

Merck & Co. has implemented sustainable procurement practices, with 58% of suppliers committing to emission reduction targets. Shifting from air to ocean freight has reduced carbon emissions and logistics costs, showcasing improved operational efficiency. Waste management efforts have diverted over 6 million kilograms of landfill waste since 2019, while renewable energy usage reached 15% in 2023, with plans for 100% by 2030. The adoption of reusable packaging further reinforces its circular economy commitment. Barriers include navigating regulatory landscapes, but Merck's strategic investments and stakeholder collaborations act as significant drivers. These sustainability initiatives have enhanced brand equity and contributed to long-term competitiveness.

5. Roche

Roche actively integrates sustainability into its supply chain, with 60% of its suppliers committed to emission reduction targets. Logistics optimizations, such as shifting from air to sea freight, have decreased operational costs and carbon emissions. Waste management initiatives have resulted in a reduction of 7 million kilograms of landfill waste since 2019. Renewable energy usage in manufacturing increased to 20% in 2023, with an ambitious target of 100% by 2030. Roche's circular economy initiatives focus on reusable packaging systems, further reducing environmental impact. Challenges include high initial investments, but Roche's innovative culture and regulatory alignment are key enablers. These measures have strengthened operational efficiency and solidified Roche's reputation as a sustainability-focused company.

Table 1: Sustainable Practices by Company

Company	Procurement	Manufacturing	Logistics	Waste Management
Pfizer	51% suppliers committed to emission targets	10% renewable electricity, targeting 100% by 2030	Air to ocean freight transition, 50,000 MT CO ₂ reduction in 2022	Reusable shipping containers
Johnson & Johnson	50% suppliers committed to emission targets	87% renewable energy, 100% in EU, US, Canada	Optimized shipping methods	23% reduction in Scope 1&2

						emissions since 2021
AbbVie	65% suppliers in emission reduction initiatives	55% renewable energy	26% reduction in transportation emissions (2023)			Increased recycling rates, product redesign
Merck & Co.	58% suppliers committed to emission targets	Targeting 100% renewable energy by 2030	Shift from air to ocean freight			6M kg landfill waste diverted since 2019
Roche	60% suppliers committed to emission targets	20% renewable energy, targeting 100% by 2030	Shift from air to sea freight			7M kg landfill waste reduction since 2019

Table 2: Company-Specific Impacts

Company	Operational Efficiency	Environmental Impact	Brand Reputation
Pfizer	Reduced transportation costs through modal shift	50,000 MT CO ₂ reduction in logistics (2022)	Leadership in supplier engagement (51%)
Johnson & Johnson	Optimized shipping costs	23% reduction in Scope 1&2 emissions, 87% renewable energy	Achievement of 100% renewable energy in key markets
AbbVie	26% reduction in transportation emissions	55% energy from renewable sources	Product redesign for sustainability
Merck & Co.	Reduced logistics costs	6M kg waste diverted from landfill	Circular economy commitment
Roche	Decreased freight costs	20% renewable energy adoption	Leadership in reusable packaging systems

Table 3: Company-Specific Barriers and Drivers

Company	Barriers	Drivers
Pfizer	High costs, Regulatory hurdles	Leadership commitment, Global partnerships
Johnson & Johnson	Implementation complexity	Proactive policies, Renewable energy investments
AbbVie	High technology costs	Leadership vision, Consumer demand
Merck & Co.	Regulatory landscape complexity	Strategic investments, Stakeholder collaboration
Roche	High initial investments	Innovative culture, Regulatory alignment

Discussion

The analysis of sustainable practices in five leading pharmaceutical companies reveals significant insights aligned with the SPSC framework.

Supply Chain Implementation: Companies demonstrate varying maturity levels in sustainable practices, with strong commitments in procurement, renewable energy usage, and logistics optimizations, leading to substantial CO₂ reductions.

Impact Assessment:

- **Operational Efficiency:** Improvements include reduced transportation costs, decreased energy consumption, and optimized resource utilization.
- **Environmental Performance:** Achievements include significant reductions in emissions, increased renewable energy adoption, and substantial waste reduction.
- **Brand Reputation:** Enhanced market positioning, improved stakeholder relationships, and increased customer trust through sustainability leadership.

Barriers and Enablers: Barriers include high implementation costs and complex regulations, while enablers include strong leadership commitment, market demand, and regulatory pressures.

Framework Validation: The SPSC framework effectively captures the interconnected nature of sustainable practices, demonstrating how improvements in one area positively influence others.

Industry Implications: The findings suggest substantial progress in sustainability, with companies like Johnson & Johnson achieving ambitious targets and a trend toward comprehensive sustainability approaches.

Findings and Recommendations

Findings

Supply Chain Functions:

- Procurement initiatives show strong progress, with supplier engagement in emission reduction targets ranging from 50-65% across all five companies.
- Manufacturing sustainability varies significantly from Pfizer's 10% to Johnson & Johnson's 87% renewable energy usage.
- Logistics optimization through modal shifts from air to ocean freight has yielded substantial emissions reductions, with Pfizer achieving 50,000 MT CO₂ reduction in 2022.
- Waste management practices demonstrate measurable success, with companies implementing circular economy principles and achieving significant waste reduction.

Impact Assessment:

- Operational efficiency improvements are evident through reduced transportation costs and optimized resource utilization.
- Environmental performance shows measurable progress, with Johnson & Johnson achieving 23% reduction in Scope 1 and 2 emissions since 2021.
- Brand reputation benefits are demonstrated through improved sustainability rankings and stakeholder trust.

Implementation Patterns:

- Companies show varying maturity levels in sustainable practice adoption.
- Renewable energy targets align across companies, with most aiming for 100% by 2030.
- Circular economy principles are increasingly integrated into waste management strategies.

Recommendations

Strategic Implementation:

1. Accelerate renewable energy adoption through:
 - Strategic partnerships with renewable energy providers
 - Investment in on-site renewable energy generation
 - Development of region-specific energy transition plans
2. Enhance supplier engagement by:
 - Implementing supplier development programs
 - Creating incentive systems for sustainable practices
 - Establishing clear sustainability criteria for supplier selection
3. Optimize logistics networks through:
 - Further transition to ocean freight where feasible
 - Investment in electric vehicle fleets
 - Implementation of route optimization technologies

Operational Excellence:

1. Strengthen waste management by:
 - Expanding circular economy initiatives
 - Implementing advanced recycling programs
 - Developing innovative packaging solutions
2. Improve monitoring and reporting by:
 - Implementing standardized sustainability metrics
 - Enhancing data collection systems
 - Developing real-time performance tracking

Industry Collaboration:

1. Foster knowledge sharing through:
 - Industry working groups
 - Best practice sharing platforms
 - Joint research initiatives
2. Develop industry standards for:
 - Sustainability reporting
 - Environmental impact measurement
 - Supplier assessment criteria

CONCLUSION

This research examined sustainable supply chain practices across five leading pharmaceutical companies - Pfizer, Johnson & Johnson, AbbVie, Merck & Co., and Roche - revealing significant progress in implementing sustainability initiatives while highlighting areas for future development. The study's findings demonstrate the industry's commitment to environmental stewardship through systematic implementation of sustainable practices

across procurement, manufacturing, logistics, and waste management functions. The analysis reveals that companies have achieved notable success in several areas: Supplier engagement in emission reduction initiatives (50-65% commitment rates); Renewable energy adoption (ranging from 10% to 87%); Logistics optimization (achieving substantial CO₂ reductions); Waste management improvements (implementing circular economy principles). The SPSC framework developed in this study provides a structured approach for understanding the interconnections between sustainable practices and their impacts on operational efficiency, environmental performance and brand reputation. The framework's feedback mechanism highlights the importance of continuous improvement and adaptation in sustainability implementation. Key achievements across the companies studied include Johnson & Johnson's 87% renewable energy usage and 23% reduction in Scope 1 and 2 emissions, Pfizer's 50,000 MT CO₂ reduction through logistics optimization, and various companies' progress toward 100% renewable energy targets by 2030. These accomplishments demonstrate the feasibility of ambitious sustainability goals while maintaining operational excellence. However, challenges remain in achieving comprehensive sustainability across pharmaceutical supply chains. High implementation costs, technical complexities and regulatory requirements continue to present barriers to faster adoption of sustainable practices. Nevertheless, strong leadership commitment, market demands and regulatory pressures are driving continued progress toward more sustainable operations. As the pharmaceutical industry continues to evolve, the integration of sustainable practices into supply chain operations will become increasingly critical for maintaining competitive advantage and meeting stakeholder expectations. The findings and recommendations from this study provide valuable insights for companies seeking to enhance their environmental performance while ensuring operational efficiency and long-term success.

REFERENCES

1. Adapt Ideations. (2023). *Addressing Sustainability Challenges In The Pharmaceutical Supply Chain*. Retrieved from <https://www.adaptideations.com/addressing-sustainability-challenges-in-the-pharmaceutical-supply-chain>
2. Seuring, S., & Müller, M. (2008). From a literature review to a conceptual framework for sustainable supply chain management. *Journal of Cleaner Production*, 16*(15), 1699-1710. <https://doi.org/10.1016/j.jclepro.2008.04.020>
3. Ahi, P., & Searcy, C. (2013). A comparative literature analysis of definitions for green and sustainable supply chain management. *Journal of Cleaner Production*, 52*, 329-341. <https://doi.org/10.1016/j.jclepro.2013.02.018>
4. Veleva, V., Bodkin, G., Todorova, S., & Peck, G. (2017). The need for better measurement and employee engagement to advance a circular economy: Lessons from Biogen's 'Zero Waste' journey. *Journal of Cleaner Production*, 154*, 517-529. <https://doi.org/10.1016/j.jclepro.2017.03.221>
5. Galitsky, C., Martin, N., & Worrell, E. (2008). Energy efficiency improvement and cost saving opportunities for the pharmaceutical industry: An ENERGY STAR guide for energy and plant managers. Lawrence Berkeley National Laboratory. Retrieved from https://www.energystar.gov/sites/default/files/buildings/tools/Pharmaceutical_Energy_Guide.pdf
6. Beske-Janssen, P., Johnson, M. P., & Schaltegger, S. (2015). 20 years of performance measurement in sustainable supply chain management – what has been achieved? *Journal of Cleaner Production*, 16*(15), 1699-1710. <https://doi.org/10.1016/j.jclepro.2015.06.004>
7. Carter, C. R., & Rogers, D. S. (2008). A framework of sustainable supply chain management: Moving toward new theory. *International Journal of Physical Distribution & Logistics Management*, 38*(5), 360-387. <https://doi.org/10.1108/09600030810882816>
8. Pagell, M., & Wu, Z. (2009). Building a more complete theory of sustainable supply chain management using case studies of 10 exemplars. *Journal of Supply Chain Management*, 45*(2), 37-56. <https://doi.org/10.1111/j.1745-493X.2009.03162.x>
9. Global Health & Pharma. (2023). A more sustainable future: Lessening the environmental impact of pharma's supply chains. Retrieved from <https://ghpnews.digital/a-more-sustainable-future-lessening-the-environmental-impact-of-pharmas-supply-chains/>
10. Barron's. (2024). Top sustainable companies 2024. Retrieved from <https://www.barrons.com/lists-rankings/top-sustainable-companies?page=1&>
11. Sustainalytics. (n.d.). Retrieved from <https://www.sustainalytics.com/>
12. AbbVie Inc. (2023). ESG action report. Retrieved from <https://www.abbvie.com/content/dam/abbvie-com2/pdfs/abbvie-esg-action-report.pdf>
13. Pfizer Inc. (2022). ESG report 2022. Retrieved from https://www.pfizer.com/sites/default/files/investors/financial_reports/annual_reports/2022/files/Pfizer_ESG_Report.pdf

14. Pfizer Inc. (2024). Impact report 2023. Retrieved from https://s28.q4cdn.com/781576035/files/doc_financials/2023/ar/Pfizer_2023_Impact_Report_11MAR2024.pdf
15. Johnson & Johnson. (2023). Health for humanity report 2023. Retrieved from https://healthforhumanityreport.jnj.com/2023/_assets/downloads/johnson-johnson-2023-health-for-humanity-report.pdf?h=Ka9OvM1t
16. Merck & Co., Inc. (2024). Impact report 2023-2024. Retrieved from https://www.merck.com/wp-content/uploads/sites/124/2024/08/Merck_ImpactReport_2023-2024.pdf
17. Roche. (2023). Annual report 2023. Retrieved from <https://assets.roche.com/f/176343/x/98b8e2ba9d/ar23e.pdf>
18. Roche. (2023). Sustainability report 2023. Retrieved from <https://assets.roche.com/f/164639/x/8e64e63c71/en-sustainability-report-2023.pdf>