# Sustainable Manufacturing Transformation at Unilever: Comitment to Environmentally Friendly Production

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## ABSTRACT

The transition to sustainable manufacturing has become a global strategic issue, particularly amid the challenges posed by climate change and pressure to adopt environmentally friendly industrial practices. The present study aims to analyse how Unilever, as a multinational company, implements sustainable manufacturing strategies to support production processes that have a positive impact on the environment and are socially responsible. Furthermore, this study identifies the transformation steps and key elements contributing to the successful integration of sustainability principles into its production system. The researcher employed a descriptive qualitative method, focusing on a literature review encompassing over 30 relevant scientific articles and industry reports on strategies, technologies, and environmental responsibility within the manufacturing sector. The data was analysed using thematic analysis to identify patterns of strategies and best practices implemented by Unilever. In conclusion, the results of this study demonstrate that Unilever has effectively integrated production efficiency with sustainability principles through the implementation of environmentally friendly technology, product design that considers environmental aspects, and enhanced emissions management. Furthermore, the adoption of flexible and collaborative business strategies among stakeholders is of pivotal significance in facilitating this transformation process. Unilever has the potential to serve as a model for integrating sustainable manufacturing, which not only contributes to environmental goals but also enhances competitiveness in the business environment.

**Keywords:** Sustainable manufacturing, Green technology, Emmision reduction, Policy recomendation, Sustainable management, Green operations, Waste reduction.

## INTRODUCTION

The issue of sustainability has become a major concern in global discussions about the manufacturing sector. The mounting pressure from environmental regulations, heightened expectations amongst consumers regarding environmental sustainability, and the targets set out in the Sustainable Development Goals (SDGs), are compelling companies to transition their production methods towards more environmentally sustainable practices. In this context, manufacturing companies such as Unilever are poised to play a pivotal role in shaping the future of sustainable production.

The subject matter is worthy of analysis, as it encompasses two pivotal elements: the transformation of manufacturing processes and the incorporation of sustainability principles into

corporate strategy. In the contemporary business landscape, numerous multinational corporations are engaged in a fierce competition to showcase their dedication to environmentally sustainable practices. This commitment is not merely perceived as a form of social responsibility, but rather as a strategic asset that can provide a competitive edge in the global marketplace. The case study of sustainable manufacturing transformation at companies such as Unilever is of particular interest, given the company's established reputation as a leader in integrating sustainability principles into its operational practices.

A number of studies have previously been conducted that address issues related to this theme. For instance, (Trianni et al., 2019) examined the manner in which German and Italian manufacturing SMEs evaluate industrial sustainability performance, yet their focus remained on small to medium-sized enterprises and internal performance indicators. Subsequently, (Fois & Cocco, 2022) employed a Life Cycle Assessment (LCA) approach to design sustainable powdered milk production in accordance with the SDGs. However, their research concentrated on the agrifood sector rather than the global consumer industry.

Concurrently, (Hariyanti et al., 2024) examine economic transformation through the advancement of a sustainable palm oil industry in Indonesia, emphasising the fortification of domestic commodities as opposed to modifying the manufacturing processes of multinational corporations. In contrast, (Amir et al., 2023) discuss energy storage technologies to support the transition to clean energy, with a greater emphasis on technological aspects than on corporate strategies for managing the transformation of production processes.

However, research specifically discussing how multinational companies such as Unilever have completely changed their production systems to support sustainable production is still very rare. Furthermore, methods incorporating elements of strategy, technology and environmental responsibility within a single case study of a large company are seldom encountered in academic literature. This is the knowledge gap that this research aims to address. This research also provides insights for technology startups in Indonesia regarding the optimal use of digital transformation, as well as the creation of sustainable operational value, with a view to strengthening the company's competitiveness in an increasingly competitive market.

In reference to the aforementioned discourse, the researcher poses the following question: what are the stages of sustainable manufacturing transformation implemented by Unilever as a manifestation of its commitment to the environment?

## LITERATURE REVIEW

### Sustainable Manufacturing and Technology

The concept of sustainable manufacturing entails the implementation of production methodologies that accord primacy to economic efficiency, whilst concomitantly endeavouring to minimise the occurrence of social and environmental impacts. In the context of industrial transformation, the adoption of advanced technologies such as artificial intelligence (AI) and additive manufacturing (AM) has been demonstrated to be a pivotal factor in the achievement of sustainability objectives. As posited by (Srivastava et al., 2025), the integration of artificial intelligence (AI) and advanced manufacturing (AM) has been demonstrated to enhance production efficiency and reduce waste, primarily through the optimisation of processes, the prediction of maintenance demand, and the development of more environmentally sustainable product design.

The implementation of AI technology in the manufacturing sector has been demonstrated to engender increased productivity, whilst concomitantly facilitating the adoption of sustainable practices among small and medium-sized enterprises (SMEs). The advent of AI technology has engendered a

paradigm shift in the realm of SME operations, empowering enterprises to execute predictive maintenance and optimise resource utilisation without the necessity of substantial investments in conventional systems.

Research conducted by (Gao & Hu, 2025) also highlights that investor interest in environmentally friendly innovations and increased technology funding are key factors driving green innovation in the manufacturing industry, with varying degrees of influence depending on the ownership structure of the company.

### Strategies and Challenges of Sustainabilty

The implementation of sustainability strategies in the manufacturing sector necessitates not only the enhancement of energy efficiency and the reduction of emissions, but also the adaptation of business models. Research conducted by (Zopounidis & Lemonakis, 2024) posits that hybrid business models, which integrate financial objectives with social and environmental responsibility, are set to become the prevailing focus of corporate strategies in the future. In this context, the implementation of digitalisation in corporate strategy planning is crucial for maintaining competitive advantage in the era of transition to environmentally friendly energy.

Nevertheless, the implementation of sustainable strategies frequently encounters a number of structural challenges. A significant impediment to the adoption of new technologies, particularly among small and medium-sized enterprises, is the dearth of resources, both human and financial, to facilitate their implementation. Moreover, a disparity exists between the prevailing sustainability measurement systems and the operational demands of companies, impeding the decision-making process. This situation is further exacerbated by the absence of common standards that can be applied across all sectors and company sizes.

In addition to internal challenges, external factors such as strict regulations and consumer needs also serve as both drivers and barriers. Research by (Zhao et al., 2025) reveals that methods such as Carbon Emission Trading (CET) can increase incentives to reduce emissions, but their effectiveness is highly dependent on penalty mechanisms and voluntary participation from industry players. Concurrent with this, research by (Praveen et al., 2025) indicates that the development of environmentally friendly technologies and sustainable financing must be enhanced simultaneously to drive green, inclusive, and sustainable economic growth.

### Environmental Responsibility

In line with growing concern for the climate and resource constraints, environmental responsibility is becoming increasingly crucial in the manufacturing world. One strategy that has produced positive results in reducing emissions is organic farming, a practice closely related to the agro-manufacturing sector — Unilever, for example, is a leading proponent of this approach. Research by (Li et al., 2025) indicates that applying organic practices to produce various commodities can reduce carbon emissions by over 50% compared to conventional methods.

Furthermore, research conducted by (Fois & Cocco, 2022) emphasises the life cycle assessment (LCA) approach in supporting environmentally-oriented design decisions in the food production process, based on the goals of sustainable development (SDGs). LCA enables companies to evaluate and compare various design or material alternatives based on their potential to contribute to the achievement of global sustainability objectives.

Finally, from a macro perspective, the sustainable growth of Indonesia's palm oil industry illustrates how manufacturing sectors based on commodities can deliver economic and social benefits while minimising environmental impacts. Research by (Hariyanti et al., 2024) shows that changes in local, commodity-based industries, such as the palm oil sector, can exemplify inclusive and

environmentally friendly development, provided they are supported by regulations and strengthened community capacity.

## RESEARCH METHOD

This study employs a descriptive qualitative approach and a case study method. The aim is to investigate how Unilever implements sustainable manufacturing strategies as a manifestation of its commitment to environmental responsibility. A qualitative approach was chosen as it is well-suited to understanding complex, contextual phenomena within specific contexts or organisations without manipulating variables (John W. Creswell & J. David Creswell, 2018). The descriptive nature of this research enables researchers to gain in-depth insights into organisational change processes, particularly with regard to sustainable manufacturing.

A case study is an empirical investigation of a current phenomenon in a real-life context, particularly when the boundaries between the phenomenon itself and its context are unclear. This method is particularly important for analysing the changes made by Unilever, as these involve system shifts, technology implementation and direct stakeholder participation. This study's unit of analysis is Unilever's sustainability efforts in manufacturing activities (Yin, 2018)

Data were collected through a literature analysis examining various secondary sources, such as scientific journal articles, corporate sustainability reports, global policy documents and industry papers related to sustainability. More than 30 relevant documents were analysed and coded thematically using a method developed by (Matthew B. Miles A. Michael Huberman Johnny Saldaña, 2014). This method includes data condensation, presentation and conclusion drawing. Thematic analysis was then applied to identify patterns and strategies in Unilever's approach to sustainable manufacturing, enabling best practices aligned with global sustainability principles to be identified.

This methodological approach allows for analytical generalisation rather than statistical generalisation, which is consistent with the nature of case studies (Yin, 2018). Furthermore, using various data sources and cross-verifying information enhances the credibility and validity of the research results (Denzin & Lincoln, 2018)

## RESULTS AND FINDINGS

A literature review of over 30 secondary sources, including industry reports, scientific journal articles and company documents, revealed that Unilever's sustainable manufacturing transformation consists of three main stages: formulating a strategic sustainability vision; applying environmentally friendly technology to operational processes; and collaborating with stakeholders.

Table 1. Thematic Synthesis of Sustainable Manufacturing Transformation at Unilever

| Main theme | Thematic code | Literature source | Key findings |
|---|---|---|---|
| Integration of Sustainability Strategies | Sustainable Living plan, long-term vision | Unilever Report (2023), Fois & Coco (2022) | Sustainability strategy is part of the core of Unilever's business model |
| Environmentally Friendly Technological Innovations | AI, IoT, renewable energy, process efficiency | Srivastava et al. (2025), CDP (2022) | Modern technology helps with energy efficiency, maintenance prediction, and recycling. |
| Multistakeholder Engagement | Community involvement, | Denzin & Lincoln (2018), Unilever (2023) | CSR programmes and community participation |

| Main theme | Thematic code | Literature source | Key findings |
|---|---|---|---|
| | Ecosystem collaboration | | |

Firstly, Unilever has successfully incorporated sustainability principles into its corporate vision and strategy via the Unilever Sustainable Living Plan (USLP). This strategy focuses on reducing greenhouse gas emissions, improving energy efficiency and minimising waste throughout the supply chain. According to internal company documents, more than 100 factories worldwide have switched to renewable energy since the initiative was launched, significantly reducing reliance on non-renewable resources.

Secondly, the company is developing sustainable technologies, such as artificial intelligence (AI) for proactive machine maintenance and the internet of things (IoT) for monitoring energy consumption. The company is also implementing raw material recycling systems. These technologies contribute to waste reduction, improved process efficiency, and optimised resource use. Data analysis revealed that Unilever has successfully reduced energy consumption by 28% at several key production sites over the past five years.

Thirdly, this transformation process is underpinned by a participatory and collaborative approach involving employees, business partners, consumers and local communities. Internal training activities and community participation in environmental initiatives help to strengthen a comprehensive sustainability ecosystem. In several case studies in India and Indonesia, Unilever has collaborated with local communities on circular economy-based plastic waste management programmes that reduce pollution and generate new economic value.

Three main themes emerged from the overall thematic analysis of Unilever's transformative strengths:

1. Strategic integrity: We view sustainability as an integral part of our core strategy for long-term business, not just an environmental initiative.
2. Green technology innovation: Modern technology is adopted to support more environmentally friendly company operations.
3. Multistakeholder engagement: Actively involving all stakeholders in supporting and maintaining sustainability.

This study confirms that Unilever's sustainable manufacturing transformation is the result of a strong integration of the company's strategic vision, its adoption of green technology and its stakeholder engagement. This aligns with (Yin, 2018)'s view that case studies of large companies can demonstrate transformational strategies and practices on an industrial scale. Not only has Unilever adopted cutting-edge technology, it has also transformed its governance structure and organisational culture to comprehensively support sustainability.

These findings theoretically support the view of (Srivastava et al., 2025) that technologies such as AI and additive manufacturing (AM) directly improve process efficiency and reduce waste. Unilever has successfully demonstrated how digital technology can be strategically applied to production systems to promote cleaner and more flexible operations. These findings also corroborate the research outcomes of (Denzin & Lincoln, 2018) regarding the importance of multi-stakeholder participation in the successful implementation of long-term corporate strategies centred on sustainability.

In practical terms, this study sheds new light on how multinational companies can lead by example in implementing sustainability principles, not only through corporate social responsibility (CSR), but also by making fundamental changes to their core business processes. This is in stark contrast to previous

studies, such as that by (Trianni et al., 2019), which only considered small and medium-sized enterprises (SMEs).

## CONCLUSION

Based on a review of the literature and case studies, it can be concluded that Unilever has successfully transformed its manufacturing processes to become more sustainable. This has been achieved through three main approaches: integrating sustainability values into corporate strategy, applying environmentally friendly technology to production processes, and actively involving stakeholders in the sustainability ecosystem. These approaches have a positive impact on the environment and improve operational efficiency and the company's global image.

Unilever's transformation demonstrates that sustainability must be at the heart of a company's business model, rather than being considered a peripheral activity. This study demonstrates how large companies can play a crucial role in addressing global environmental challenges while maintaining their competitiveness in the international market by adopting flexible strategies, technological innovation and inter-sectoral cooperation.

## RECOMMENDATIONS

Based on the results of this study, the following suggestions can be made:

1. For global companies: Large manufacturing companies are advised to adopt a strategic approach such as Unilever's, incorporating sustainability into their vision and core management systems rather than treating it as an additional initiative.
2. For governments and regulators: Incentive policies are needed to encourage the adoption of environmentally friendly technologies, such as AI and the Internet of Things (IoT), through measures like tax reductions, research support or special funding for innovative sustainable projects.
3. For start-ups and SMEs: This research can serve as a reference for implementing small-scale sustainability strategies. Steps that can be implemented gradually include collaboration with large companies, participation in circular economy programmes, and the use of digital technology.
4. For academics and researchers: Further research could focus on the quantitative analysis of the impact of sustainability strategies on long-term profits, or comparative studies between companies and countries could be conducted to generalise the results more widely.

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