**Examining the importance of Green Warehousing in the Context of Supply Chain Management: A Study with selected Logistics firms**

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# ABSTRACT

*This article emphasizes the importance of Green warehousing in the context of supply chain management, with a focus on specific logistics organizations. This also emphasizes the key lessons from the connected Production network activities, such as transportation, warehousing, stock administration, recharging, and cold chain management across the board. Furthermore, the article discusses Green warehousing and its impact on coordinated operations firms. Warehousing is the division of large business calculated capacities in charge of additional space and inventory administration beginning from supplier receipt and ending with utilization point. Warehousing capacity is extremely important in a store network because it acts as a hub in linking the material streams between the provider and customer. In today's competitive economy, businesses are always driven to innovate.*

**Key words**: Supply chain management, Green Warehouse, store network, transportation.

# ­­­­­I. INTRODUCTION

Green Warehouses can generate electricity using renewable energy sources such as solar, wind, or hydropower. The warehouse may drastically lower its carbon footprint and contribute to the battle against climate change by reducing its dependency on nonrenewable energy sources. Ware housing’s relevance in supply chain management cannot be emphasized. It acts as a vital hub, increasing the supply chain's overall efficiency, flexibility, and reactivity. Warehousing has a varied role in ensuring that items flow smoothly from producers to consumers, providing various significant benefits that contribute to business success and customer happiness. This paper focuses on specific logistics such as “Mahindra Logistics Ltd, DHL, and IKEA”. In organization, dynamic business world, where customer demands are high and market conditions can change swiftly, good storage is vital. It helps to supply chain resilience, operational efficiency, and the flexibility to adjust to changing market needs. Warehousing enables organizations to stay competitive and give value to their consumers by successfully managing inventory, improving order fulfillment procedures, and providing a strategic buffer against risks.

## PROBLEM STATEMENT

 The study mainly focuses on Examining the Importance of Green Warehousing in the Context of Supply chain management: A study with Selected Logistics firms such as Mahindra Logistics Ltd, DHL, and IKEA. It also helps understand the decisions made by the organization with reference in adopting the Green warehouse and other supply chain management facilities. In today's constantly changing global corporate scene, sustainability and environmental responsibility have taken precedence. As enterprises attempt to lower their carbon footprint and minimize their environmental impact, the logistics and supply chain sector has the difficulty of harmonizing with these environmentally friendly goals. The warehouse portion of the supply chain, in particular, gives a substantial opportunity for optimizing operations to reduce resource consumption, energy usage, and overall environmental impact while maintaining efficient and effective distribution processes. The "Green Warehousing" dilemma encapsulates the requirement for developing creative strategies and solutions to transform traditional storage practices into environmentally responsible operations while maintaining timely and accurate product delivery. It helps to find the problems faced by them in handling it on the whole.

# II . LITERATURE REVIEW

**Lew Jia Xin (2019)** named their research as “A Study on factors influencing green warehousing practices”. The paper explains about the green practice and about the drivers in the Malaysia warehousing industry and also tried to analyze the factors of adopting green warehousing (GWH).The researcher concluded that the independent variables has a significant relationship with the green warehousing practices in the present working environment. The factors which influences the green warehouse practices are the government and the mangers factors.

 **Dr. A. Pasumpon Pandian (2019)** in his research “Artificial Intelligence application in smart warehousing environment for Automated Logistics” .The paper tried to examined the automated storage and the retrieval using the artificial intelligence ,cloud computing ,internet of things as to have an access of the stock available in the warehouse at any time. The study revealed that the smart warehousing logistics shows higher performance and it also enhanced the efficiency for the warehouse which holds a vast variety of goods that are high in number .**Jean-Paul Rodriguez (2017)** named their research as “Green Logistics (The Paradoxes of)”.This paper tried to examine the issues in the green logistics and also the paradoxes of environment it created in the transportation modes. The researcher concluded that the logistics firms are trying to find a relationship between the environmental considerations and its profitability which made the industry to adopt to the green measures. **Minh Luu (2016)** named his research as “Developing the implementation of green warehousing at IKEA Finland. The study tried to examine the warehouse sustainability of IKEA and the energy efficiency management and it creates a proposals for the sustainable warehouse to IKEA. The findings of the study demonstrates how the company implements the waste management excellent. And also the company has applied innovation to facilitate its green warehousing practices. **Thoo Ai China (2015)** titled their research as “Green Supply chain management, Environment collaboration and sustainability performance”. The study tried to analyze the environmental collaboration to facilitate the GSM strategic formulation execution. The findings revealed the importance of manufacturing companied in developing environmental collaboration with their suppliers in order to achieve the sustainability performance. **Burinskiene (2018) titled** their study as “A Simulation study for the sustainability and reduction of waste in the warehouse logistics”. In this study the researchers analysed the warehouse processes as to identify the one process which are wasteful. The researcher concluded about the product guidelines on how to make the operations of warehouse more sustainable. **Ramaa.A (2012**) titled their research as “Impact of warehouse management system in the supply chain”. The paper also highlights the how the study carried out to evaluate the performance of the warehouse and to enhance the productivity of the manual warehouses by developing a WMS frame work and the analysis of the cost benefit. Hence the researcher concluded that the warehouses also influences the performance of the supply chain,

## 2.1. OBJECTIVES OF THE STUDY

1. To examining the importance of the green warehouse in context of the supply chain management.
2. To analyse the factors that influence green Warehousing.
3. To analyze the ways to adopt the green warehousing

**III METHODOLOGY**

**IV. EXAMINING THE IMPORTANCE OF GREEN WAREHOUSING**

**Three trends that are increasing the importance of green warehousing**

**1. Increases in global e-commerce activity** - Global e-commerce is expected to rise by 16.8% to $4.921 trillion USD in 2021. With the expansion of e-commerce comes the need for more logistics infrastructure to meet demand. Scaling up with an environmentally sound infrastructure becomes increasingly vital as businesses try to optimize their shipping operations and accommodate expanding online purchase volumes.

**2. Consumer accountability demands** - Consumers who are driving significant growth in e-commerce are also aware of trends in how their purchasing affects the environment. Sustainability preferences have been demonstrated to influence how consumers perceive brands, including their likely to purchase more in the future. While consumers are less directly exposed to the environmental impacts of the warehouse than other touch points such as packaging, businesses' overall energy consumption has an impact on ESG performance and the narratives surrounding overall energy use and carbon footprint reduction that are central to their public image.

**3. Possibility of cost savings through efficiency** - Green warehousing techniques are not just excellent for the environment; they may also benefit businesses by increasing efficiency and lowering energy use. With advancements in renewable energy efficiency, more energy can be produced with fewer emissions. Investigating where green energy purchase might be useful for the warehouse is a good first step towards lowering carbon footprints. Automation advancements in the warehouse environment can also help to encourage sustainable practices by increasing efficiency. Today, thanks to technological advances such as computer vision and machine learning, even difficult operations such as picking and placement can be partially or totally automated. These are being implemented as part of the Industry 4.0 initiative.

**Major reasons behind company’s adopting the green warehousing** -

**Innovation and Competitive Advantage**: Pursuing green warehousing frequently demands the use of novel technology and methodologies. This pursuit of innovation can result in the creation of one-of-a-kind solutions that provide a competitive advantage in the market. Companies that pioneer sustainable storage practices establish themselves as leaders in the sector.

**Improves company’s reputation:** Green warehousing practices improve a company's reputation and brand image as an ecologically conscientious and socially responsible institution. Such branding has the potential to increase consumer loyalty while also attracting new customers who respect sustainability. Positive public impression adds to enhanced market trust and credibility.

**Risk Reduction**: Relying on nonrenewable resources and inefficient practices can expose businesses to supply chain interruptions and pricing volatility. Green warehousing practices, such as renewable energy integration and resource efficiency, can help to manage these risks by lowering reliance on scarce resources and uncertain markets.

**Environmental Responsibility**: A real commitment to decreasing the environmental impact of business operations is one of the key motives for adopting green warehousing practices. Companies recognise the critical importance of mitigating climate change, conserving natural resources, and protecting ecosystems. They contribute to a more environmentally friendly supply chain and demonstrate their commitment to corporate social responsibility by implementing sustainable warehousing

**Cost reductions**: Green storage frequently results in significant long-term cost reductions. Lower operational costs are closely related to energy-efficient facilities, optimized resource utilization, and reducing the waste. And to invest in renewable energy, energy-efficient technology and reduction of waste programmes pays off in the form of lower utility bills, maintenance costs, and waste disposal fees.

**Regulatory Compliance**: To decrease emissions, waste, and conserve energy, many regions have implemented stringent environmental restrictions and requirements. Companies that implement green warehousing practices maintain compliance with these rules, avoiding potential penalties and legal liabilities. Furthermore, compliance with environmental regulations can improve a company's reputation and connections with regulatory organizations.

**Market Differentiation**: Green storage distinguishes businesses in a crowded marketplace. When making purchasing selections, consumers and business partners are increasingly emphasizing ecologically friendly practices. Companies that commit to sustainable warehousing not only attract environmentally conscientious customers, but they also strengthen ties with environmentally conscious suppliers and partners.

**Investor and Stakeholder Expectations**: Environmental performance is increasingly being considered by investors, shareholders, and other stakeholders when assessing a company's long-term survival. Companies may attract responsible investment and maintain healthy relationships with stakeholders concerned about sustainability by demonstrating a commitment to green warehousing practices.

**Employee Engagement**: Green projects frequently resonate with environmentally conscientious employees. Implementing green warehousing practices can boost employee morale, engagement, and satisfaction since employees are glad to be connected with a company that cares about the environment.

**Long-Term Business Viability**: Sustainable practices are intrinsically linked to long-term business viability. Companies ensure their operations stay resilient in the face of changing environmental rules, consumer preferences, and market dynamics by decreasing waste, saving resources, and minimizing carbon emissions.

**Mahindra Logistics Ltd Green warehousing:**

Mahindra Logistics Ltd, is one of the major participant in the Indian supply chain and logistics business emerged as a trailblazer in the promotion of green storage practices. Recognizing the essential junction of business operations and environmental responsibility, the company has made deliberate measures to integrate sustainability into its warehouse operations, creating an industry-leading example.

Sustainability is deeply engrained in Mahindra Logistics' company ethos. Traditional warehouse practices, the corporation recognizes, can have major environmental consequences, including energy usage, emissions, trash generation, and resource depletion. As a result, Mahindra Logistics has embarked on a mission to turn its warehouses into environmentally friendly hubs, guided by a holistic vision of sustainability.

The key initiatives of Mahindra Logistics Ltd are:

**IKEA GREEN WAREHOUSING:**

Compliance with environmental regulations is the first motivation for green business strategy implementation by businesses. Each public power sets explicit principles to secure and protect ecological biological systems in neighborhood nations. Infringement of these regulations generally results in critical fines from state and, surprisingly, legitimate claims at natural court. Likewise, there are a significant number of environmental norms and confirmations which are perceived and operated internationally. Getting these norms and confirmations are critical benefits for worldwide firms to enter new objective business sectors. The environmental management certification ISO14000 from the International Organization for Standardization (ISO 14000) is a good example.

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**CO2 Emission in logistics and transportation industry:**

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**DHL GREEN WAREHOUSING:**

1. DHL adds 18 new bio-fuel trucks for the races in the Europe during the season
2. 60% of the carbon emissions can be cut down when compared to the normal fuels which is potential for the concept of green savings
3. The use of sustainably fueled trucks could be expanded through the agreement in the future
4. DHL and Formula 1 are committed to be a better future and to take further steps to reduce their footprints in carbon.

With a new effort this season, DHL and Formula 1 ® are bringing the sustainability in the logistics as to reach heights in their collaboration. DHL is launching its first biofuel this season and deploys 18 vehicles to help formula one to achieve its objective of becoming net zero by the year 2030. The new trucks which runs on HVO100 Drop in fuel (Hydro treated vegetable oil)..As it resulted that every truck can reduce the emissions at least 60% as and when compared to that of normal fuels. The collaboration with Formula 1 also demonstrates the sustainability and the reduction of carbon foot print. And the companies are making logistics sustainable and they are excited to launch the first fleet of trucks powered by the year of sustainability. And also the 18 trucks to contribute for the lower emission DHL which they demonstrate to their customers

**V CONCLUSION**

In conclusion, the adoption of green storage practices by businesses is a critical step towards constructing a sustainable future. Businesses have emerged as essential agents of change as the globe grapples with environmental concerns and seeks viable answers through their dedication to eco-conscious operations. The transition to green storage is more than a passing fad; it is a strategic need with far-reaching implications. Companies that embrace green storage not only demonstrate their ethical commitment to protect the environment, but they also position themselves for long-term success in a dynamic business context. The numerous benefits, ranging from cost savings and regulatory compliance to improved reputation and brand distinctiveness, highlight the practical benefits of sustainable practices. These practices are popular among a wide range of stakeholders, from consumers and investors to employees and partners, who are increasingly valuing sustainability in their decisions. The path to green warehousing requires creativity, teamwork, and constant development. Companies must investigate new technologies, optimize resource utilization, incorporate renewable energy sources, and put data-driven decision-making procedures in place. This journey necessitates a comprehensive approach which examined the whole supply chain from the raw material procurement to the delivery of the products to the destined customers.

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