


# Chapter 1

## Eco-Friendly and Energy-Efficient Warehouses in Modern Supply Chains: Comprehensive Literature Review

Mohamed Souleimen Ouannes

 <https://orcid.org/0000-0003-0335-6013>

King Faisal University, Saudi Arabia

### ABSTRACT

*Scarcity of resources and climate change have generated mounting demand for sustainability in every field and industry, including supply chains and logistics. Warehouses, being one of the most vital links in supply chains, require additional innovative efforts to render them more agile. This chapter addresses the topic of green and energy-efficient warehouses as key factors in the transition to more sustainable supply chains. We begin with an overview of traditional warehouses that are beset by a number of environmental problems. This serves to bring us to the demand for the creation of green warehouses. The paper also covers the main management practices to enable these transformations. In order to provide the reader with a clearer picture, we provide examples of pioneer companies in the sector. The paper further highlights that the future of green warehouses is heading in the direction of greater digitization. We conclude that the adoption of green warehouses is no longer an optional decision but a strategic imperative to ensure continuity and leadership in a market.*

DOI: 10.4018/979-8-3373-3176-8.ch001

Copyright © 2026, IGI Global Scientific Publishing. Copying or distributing in print or electronic forms without written permission of IGI Global Scientific Publishing is prohibited. Use of this chapter to train generative artificial intelligence (AI) technologies is expressly prohibited. The publisher reserves all rights to license its use for generative AI training and machine learning model development.

## SUMMARY

Currently, the scarcity of resources and climate change have generated mounting demand for sustainability in every field and industry, including supply chains and logistics. Warehouses, being one of the most vital links in supply chains, require additional innovative efforts to render them more agile.

This academic paper addresses the topic of green and energy-efficient warehouses as key factors in the transition to more sustainable supply chains.

We begin with an overview of traditional warehouses that are beset by a number of environmental problems like air and noise pollution, high-energy consumption and inadequate waste management.

This serves to bring us to the demand for the creation of green warehouses based on energy-conserving technologies such as smart lighting, solar energy, energy management systems, and automation.

The document also covers the main management practices to enable these transformations, including the creation of internal environmental policies, employees training, monitoring environmental performance, and engaging with sustainable suppliers. In order to provide the reader with a clearer picture, we provide examples of pioneer companies in the sector that have implemented sustainability concepts in their warehouses, thereby reducing their carbon footprint while enhancing operational efficiency. The article further highlights that the future of green warehouses is heading in the direction of greater digitization, greater reliance on technology and renewable energy, and the use of the circular economy in supply chains. We conclude that the adoption of green warehouses is no longer an optional decision but a strategic imperative to ensure continuity and leadership in a market that is rapidly transforming towards environmental sustainability standards.

Green warehouse is an essential component of sustainable development in contemporary supply chains. The transition to green warehouses requires a combination of modern technologies, advanced management practices, and smart investments. By adopting sustainability principles, companies, not only protect the environment, but also improve their operational efficiency and enhance their image in front of customers and investors.

The shift to green warehouses is no longer an option, but has become a strategic necessity in a rapidly changing world that is moving towards a green economy. However, the success of this trend requires integrated efforts on legislative, technical and training levels to ensure its sustainability and achieve a concrete impact on the environment and society.

28 more pages are available in the full version of this document, which may be purchased using the "Add to Cart" button on the publisher's webpage: [www.igi-global.com/chapter/eco-friendly-and-energy-efficient-warehouses-in-modern-supply-chains/394380](http://www.igi-global.com/chapter/eco-friendly-and-energy-efficient-warehouses-in-modern-supply-chains/394380)

## Related Content

---

### Comparative Energetic and Exergetic Analysis of Conventional and Sloped Solar Chimney Power Plants

Hela Atia, Adrian Ilinca, Ali Snoussi, Rachid Boukchina and Ammar Ben Brahim (2020). *International Journal of Energy Optimization and Engineering* (pp. 57-73). [www.irma-international.org/article/comparative-energetic-and-exergetic-analysis-of-conventional-and-sloped-solar-chimney-power-plants/259977](http://www.irma-international.org/article/comparative-energetic-and-exergetic-analysis-of-conventional-and-sloped-solar-chimney-power-plants/259977)

### Future Trends and Research Directions

Satya Subrahmanyam (2025). *Neural Networks and Graph Models for Traffic and Energy Systems* (pp. 373-400). [www.irma-international.org/chapter/future-trends-and-research-directions/370943](http://www.irma-international.org/chapter/future-trends-and-research-directions/370943)

### A Novel Approach for Load Frequency Control of Interconnected Thermal Power Stations

Yogendra Arya, H.D. Mathur and S.K. Gupta (2012). *International Journal of Energy Optimization and Engineering* (pp. 85-95). [www.irma-international.org/article/novel-approach-load-frequency-control/65753](http://www.irma-international.org/article/novel-approach-load-frequency-control/65753)

### A Feasibility Study in Energy Harvesting from Piezoelectric Keyboards

Tom Page (2017). *International Journal of Energy Optimization and Engineering* (pp. 1-23). [www.irma-international.org/article/a-feasibility-study-in-energy-harvesting-from-piezoelectric-keyboards/178615](http://www.irma-international.org/article/a-feasibility-study-in-energy-harvesting-from-piezoelectric-keyboards/178615)

### A WDO Framework for Optimal Deployment of DGs and DSCs in a Radial Distribution System Under Daily Load Pattern to Improve Techno-Economic Benefits

Satish Kumar Injeti and Thunuguntla Vinod Kumar (2018). *International Journal of Energy Optimization and Engineering* (pp. 1-38). [www.irma-international.org/article/a-wdo-framework-for-optimal-deployment-of-dgs-and-dscs-in-a-radial-distribution-system-under-daily-load-pattern-to-improve-techno-economic-benefits/197358](http://www.irma-international.org/article/a-wdo-framework-for-optimal-deployment-of-dgs-and-dscs-in-a-radial-distribution-system-under-daily-load-pattern-to-improve-techno-economic-benefits/197358)