

Chapter 4

From Waste to Resource: Circular Waste Management and Energy Production in Hotels

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ABSTRACT

The hospitality industry, a cornerstone of the global economy, faces significant challenges in managing food waste sustainably. Conventional waste disposal methods incur substantial costs and environmental damage. As a result, hotels are embracing sustainable technologies like anaerobic digestion, biogas production, thermal processes like pyrolysis, gasification etc Based on secondary sources, this chapter focuses on economic benefits of Waste-to-Energy innovations in hotels such as cost savings from reduced waste disposal fees, potential revenue streams from energy sales, and improved operational efficiency. Additionally, the chapter highlight environmental benefit including reductions in greenhouse gas emissions and the promotion of a circular economy. Ultimately, this chapter offers insights into integrating renewable energy from waste innovations into hotel operations to achieve economic and environmental goals. It strives to aid hotel managers, policymakers, and stakeholders in adopting and maximizing waste-to-energy systems

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contributing to a more sustainable hospitality sector.

INTRODUCTION

The hospitality industry is a vibrant and dynamic sector, significantly contributing to the global economy through tourism, employment, and cultural exchange. However, it is also a major consumer of natural resources and a significant waste producer, which leads to considerable ecological repercussions. In an era where sustainability is becoming essential for businesses, the hospitality industry is under increasing pressure to adopt eco-friendly practices (Kularatne et al., 2019). Omune et al., (2021) describe that this shift is driven not only by regulatory requirements and growing environmental awareness among consumers but also by recognizing that sustainable practices can lead to cost savings, improved brand image, and a competitive advantage. Sustainability in the hospitality sector encompasses various practices, including energy efficiency, water conservation, waste reduction, and sustainable sourcing. Among these practices, waste management stands out as a crucial area with considerable potential for improvement. The hotel sector typically generates various types of waste, including organic waste (e.g., food scraps), plastics, paper, glass, and hazardous materials such as cleaning chemicals (Mensah & Ampofo, 2021; Omune et al., 2021). Typical waste management practices in the hotel industry tend to be inefficient and costly. The linear model of “take, make, dispose” depletes resources and results in waste accumulation in landfills (Elisha, 2020). This approach carries significant financial and environmental costs, such as high disposal fees, increased greenhouse gas emissions, and resource scarcity. Adopting effective waste management practices not only reduces the environmental impact of hotels but also advances the industry's sustainability objectives as a whole. Through waste reduction, material reuse, and effective recycling programs, hotels can markedly decrease their environmental footprint while boosting operational efficiency.

Circular waste management aims to minimize waste creation, maximize material reuse, and recycle resources to establish a self-sustaining cycle (Luttenberger, 2020; Adami & Schiavon, 2021). In contrast to the linear economy that depletes resources and accumulates waste, this approach promotes resource efficiency through recycling and reuse, aiming for sustainability. Within a circular economy framework, waste transforms into a valuable resource, contributing to reduced environmental impact and enhanced sustainability efforts (Pamfilie et al., 2018). Circular waste management is essential for hotels due to their high resource consumption and waste production. Adopting a circular economy model helps optimize operations, reduce costs, and support environmental conservation. This shift meets growing stakeholder expectations, including customer demands and regulatory requirements for sustainable

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