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Research on Optimization Strategies for Green Tourism Hotel Management from the Perspective of Low-Carbon Economy

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Abstract: With the global promotion of the low-carbon economy concept, green tourism hotels, as a new hotel management model, are receiving increasing attention from both consumers and the industry. The low-carbon economy advocates for the reduction of greenhouse gas emissions, improved energy efficiency, and the promotion of sustainable development. Against this backdrop, green tourism hotels aim to achieve a win-win situation for ecological protection and economic benefits by optimizing management, innovating services, and applying green technologies. This paper explores optimization strategies for green tourism hotel management under the low-carbon economy framework. It first analyzes the relationship between the low-carbon economy and green tourism hotel management, then summarizes the current status and challenges in green tourism hotel management, and proposes optimization strategies in areas such as energy management, green procurement, waste disposal, and customer engagement. Finally, through case analysis, it demonstrates practical management practices for green tourism hotels in a low-carbon economy, providing hotel managers with feasible improvement paths. The findings offer theoretical support and practical guidance for the transformation and sustainable development of the hotel industry in the low-carbon economy era.

Keywords: low-carbon economy; green tourism hotels; management optimization; energy management; green procurement

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1. Introduction

As global climate change becomes an increasingly urgent issue, the low-carbon economy has become one of the core concepts for promoting sustainable development in the international community. In this context, green tourism hotels, as an essential part of achieving low-carbon economy goals, are gradually attracting the attention of both the industry and consumers. Green tourism hotels not only focus on environmental protection and resource conservation, but also optimize management models, innovate technology applications, and improve service quality in order to meet customer needs while minimizing negative environmental impacts. In particular, with the rapid development of the tourism industry today, optimizing the management of green tourism hotels is especially important. It not only helps improve the hotel's economic performance but also contributes to the green transformation of the tourism industry. Therefore, this study aims to explore optimization strategies for green tourism hotel management from the perspective of the low-carbon economy, analyze the impact of the low-carbon economy on the hotel industry, and propose feasible management improvement solutions. By evaluating the

current state of green tourism hotel management, this research will delve into how to optimize areas such as energy efficiency, green procurement, waste management, and customer participation under the low-carbon economy framework, thereby providing theoretical support and practical guidance for the hotel industry's sustainable development practices [1].

2. Low-Carbon Economy and Green Tourism Hotel Management Overview

2.1. The Basic Concept of Low-Carbon Economy

The low-carbon economy refers to an economic model that reduces greenhouse gas emissions, promotes the transformation and optimization of energy structures, and supports sustainable development. Its core idea relies on low-carbon technologies, improved energy efficiency, and the application of clean energy to gradually reduce dependence on traditional fossil fuels, thereby slowing down climate change and reducing carbon emissions. The low-carbon economy emphasizes the coordination of economic growth with environmental protection through innovative production and consumption patterns, aiming to minimize the consumption of natural resources and damage to the ecological environment while ensuring economic development. The realization of a low-carbon economy requires a comprehensive effort, including policy support, technological progress, industrial restructuring, and broad public participation. In this process, energy efficiency and the low-carbon transformation of energy are key factors [2]. Particularly in service industries such as the hotel sector, the practice of a low-carbon economy involves adopting eco-friendly building designs, energy-saving equipment, renewable energy sources, and optimizing resource management and operational processes to reduce carbon footprints.As global climate change becomes more severe, more countries and regions have recognized the importance of the low-carbon economy and are promoting low-carbon transformations through legislation and policy. Therefore, the low-carbon economy is not only an economic model but also a social development concept, and its promotion and implementation have profound implications for various industries, especially the tourism and hotel industry. In the management of green tourism hotels, the introduction of a low-carbon economy encourages the hotel industry to transition toward more environmentally friendly, energy-efficient, and sustainable development paths [3].

2.2. Definition and Characteristics of Green Tourism Hotels

Green tourism hotels refer to hotels that prioritize environmental protection, resource conservation, and sustainable development during their operations. The core concept of these hotels is to implement environmental management measures, adopt green building designs and technologies, and promote green consumption to minimize the negative environmental impact of hotel operations and enhance customers' green experiences. Green tourism hotels focus not only on their own energy consumption and waste emissions but also on improving resource utilization efficiency. They advocate low-carbon, energy-saving, and eco-friendly management models, ultimately achieving both ecological and economic benefits. In terms of energy management, green tourism hotels use energy-efficient equipment and technologies, such as LED lighting, smart air conditioning systems, and solar water heating systems, to reduce energy consumption and carbon emissions. Through intelligent energy management systems, hotels can monitor and adjust energy usage in real time, ensuring maximum energy efficiency and minimizing waste. This system not only helps hotels reduce costs but also significantly reduces their environmental impact. Green building design is another important feature of green tourism hotels [4]. Hotels typically use environmentally friendly materials and green construction methods, with a focus on natural ventilation, lighting, and efficient energy use. The concept of green building emphasizes minimizing the consumption of natural resources during construction, reducing energy consumption, and improving building efficiency.

Additionally, hotels often incorporate water-saving devices and rainwater collection systems to further reduce resource waste. Waste management and resource recycling are also essential components of green tourism hotels. Hotels implement waste sorting and reduction measures, ensuring waste minimization, resource recycling, and harmless disposal. Hotels encourage customers to use reusable towels, toiletries, and other items, aiming to reduce single-use products and minimize waste generation at the source. Furthermore, hotels actively promote recycling of paper, plastic bottles, and other materials, enhancing the resource utilization level of waste. Water resource management is another crucial area for green tourism hotels. By using low-flow showerheads, water-saving toilets, and other devices, hotels can effectively reduce water consumption. Many green tourism hotels also have water recycling systems that enhance water utilization efficiency, reduce reliance on natural water sources, and lower operational costs. Green certifications and environmental labels are distinctive features of green tourism hotels. Through certifications like ISO 14001, green hotel certification, or LEED certification, green tourism hotels demonstrate their efforts and achievements in environmental protection. These certifications not only recognize the hotel's environmental management but also enhance the hotel's brand image and market competitiveness. Additionally, green tourism hotels emphasize customer involvement and the transmission of environmental culture. Hotels encourage customers to engage in eco-friendly behaviors during their stay, such as energy-saving, water conservation, and low-carbon consumption. Hotels may also offer green dining options, eco-friendly facilities, and promote more sustainable lifestyles, further enhancing the customers' green experience. In summary, the characteristics of green tourism hotels are not only reflected in their internal management and facility optimization but also in their comprehensive green philosophy and innovative management models. These hotels make a positive contribution to the sustainable development of the tourism industry while meeting modern consumers' demands for comfort and service quality. Their environmental value and social responsibility are further strengthened, enhancing their competitiveness and appeal in the market [5].

2.3. Impact of Low-Carbon Economy on Green Tourism Hotel Management

The rise of the low-carbon economy has had a profound impact on the management of green tourism hotels, prompting the hotel industry to undergo a series of transformations and innovations in operations, management, services, and technological applications. As an important measure to combat climate change and promote sustainable development, the low-carbon economy demands that industries reduce carbon emissions and improve energy efficiency. This has set higher demands on the operational models and management strategies of green tourism hotels. Firstly, the low-carbon economy has driven innovation and upgrades in energy management within green tourism hotels. The hotel industry is an energy-intensive sector with significant energy consumption and carbon emissions. Under the low-carbon economy framework, green tourism hotels need to adopt more efficient energy management measures, such as using energy-saving equipment and renewable energy sources like solar, wind, and geothermal energy to reduce reliance on traditional energy sources. Additionally, the introduction of smart energy management systems enables hotels to monitor energy consumption in real time, optimize energy distribution, and reduce both energy use and carbon emissions [6]. This transformation not only aligns with the goals of the low-carbon economy but also helps hotels lower operational costs and improve overall efficiency. Secondly, the low-carbon economy has raised the environmental standards for the design and construction of green tourism hotels. In response to the low-carbon economy, green building has become a trend in hotel development. The low-carbon economy requires green tourism hotels to focus more on eco-friendliness and resource conservation in building design and material selection, such as using environmentally friendly materials, green roofs, and energy-efficient glass to enhance energy efficiency and ecological value. Furthermore, hotels need to

consider using efficient water resource management systems, such as rainwater harvesting and water-saving devices, to reduce water waste and further improve the sustainability of the hotel. The low-carbon economy has also spurred innovation in waste management and the circular economy within green tourism hotels. With increasing awareness of environmental protection, the hotel industry faces greater demands for waste treatment and resource recycling. In a low-carbon economy environment, green tourism hotels are committed to reducing waste generation through waste sorting, reuse, and recycling, aiming for green operations. The low-carbon economy requires hotels not only to minimize natural resource consumption but also to reduce the environmental impact of waste, driving the hotel industry toward a more sustainable and eco-friendly direction. Moreover, the low-carbon economy has significantly influenced customer management and marketing strategies for green tourism hotels [7]. As consumer awareness of environmental protection increases, more customers consider environmental friendliness as an important factor when choosing hotels. Green tourism hotels attract environmentally conscious customers by offering eco-friendly facilities, green dining options, and encouraging customer participation in energy-saving and emissions-reduction activities. This green marketing strategy not only helps improve the hotel's brand image but also boosts customer satisfaction and loyalty, enhancing market competitiveness. Under the influence of the low-carbon economy, green tourism hotels not only attract customers but also contribute to enhancing the sustainability of the entire industry. In summary, the low-carbon economy has driven innovation and optimization in green tourism hotels across various areas, including energy management, building design, waste treatment, and customer management. These transformations are pushing the hotel industry toward more eco-friendly, energy-efficient, and sustainable development. These changes not only comply with national and global low-carbon development policies but also align with the growing demand for sustainable practices in the tourism and hospitality sector [8].

3. Optimization Strategies for Green Hotel Management under a Low-Carbon Economy

Under the context of a low-carbon economy, green tourism hotels face many challenges but also present numerous opportunities for optimization. In order to cope with the pressures brought about by a low-carbon economy, green tourism hotels need to make adjustments not only in energy management and resource utilization but also in service, marketing, and technological innovation. The following are several main optimization strategies aimed at helping green tourism hotels achieve sustainable development and management goals under the low-carbon economy. Firstly, improving energy management and applying energy-saving technologies is one of the key strategies for optimizing green tourism hotel management. Energy consumption is one of the major costs in hotel operations and a significant source of carbon emissions. Driven by the low-carbon economy, green tourism hotels should actively adopt energy-saving equipment and renewable energy sources to reduce reliance on traditional energy. For example, hotels can install smart temperature control systems, LED lighting, and solar water heaters to reduce energy consumption. At the same time, the introduction of intelligent energy management systems can monitor and optimize the hotel's energy usage in real-time, ensuring efficient use and conservation of energy. By designing the hotel's energy structure properly, hotels can not only achieve energy-saving and emission reduction but also effectively lower operational costs and improve economic benefits. Secondly, enhancing green building design and technological innovation is also a critical strategy for optimizing green tourism hotel management under a low-carbon economy. Green buildings not only reduce energy consumption but also improve the environmental adaptability and comfort of the building. During the hotel construction phase, green design should focus on selecting eco-friendly materials, optimizing building structures, and improving energy efficiency. Hotels can use double-glazed windows, green roofs, rainwater collection systems, and other

designs to further enhance the building's green performance. In the renovation of existing hotels, advanced green technologies such as energy-efficient air conditioning systems, rainwater recovery systems, and geothermal heat pumps can effectively reduce energy waste and improve the hotel's green certification level. Furthermore, hotels should closely monitor the latest developments in green technologies, continuously update and upgrade their equipment, and ensure they stay at the forefront of the industry [9]. In terms of operational management, promoting intelligent management and green services is an important way to enhance the competitiveness of green tourism hotels. Intelligent management not only optimizes hotel operational efficiency but also reduces waste of energy and resources. For example, through big data and Internet of Things (IoT) technologies, hotels can implement intelligent management for guest rooms, public areas, and dining services, adjusting temperature, lighting, and water usage in real-time to ensure energy conservation. At the same time, intelligent management systems can also provide more accurate customer service, improving customer satisfaction. In addition, hotels can further promote environmental protection by offering green services such as eco-friendly dining options, environmentally friendly toiletries, and paperless check-in. By combining intelligent technology with green services, green tourism hotels can offer guests a more convenient, comfortable, and eco-friendly stay. Raising the environmental awareness of employees and customers is also a necessary measure for optimizing green tourism hotel management. In the context of a low-carbon economy, the environmental awareness of both employees and customers directly affects the effectiveness of green management practices. Hotels should increase employees' environmental awareness and sense of responsibility through regular training and incentive mechanisms to ensure the effective implementation of green management practices. For instance, hotels can provide regular environmental training to help employees understand the importance of energy-saving and emission-reduction, and train them to implement green practices such as waste classification, water conservation, and energy-saving procedures. Additionally, hotels should raise customers' environmental awareness through green marketing and promotional activities, encouraging customers to participate in the hotel's green management, such as by choosing eco-friendly room types and taking part in green initiatives. By involving both employees and customers, the green operation of the hotel can gain wider support and promotion. Meanwhile, strengthening green marketing and brand building is an important strategy for enhancing the market competitiveness of green tourism hotels. As consumers' environmental awareness increases, more customers are inclined to choose hotels that meet green standards. Therefore, green tourism hotels need to utilize effective green marketing strategies to transform their environmental advantages into market competitiveness. Hotels can enhance their green image by obtaining green certifications, participating in environmental protection activities, and promoting green products and services. In the marketing communication process, hotels should emphasize their achievements in energy-saving, environmental protection, and sustainable development to attract environmentally conscious customer groups. At the same time, hotels can cooperate with tourism platforms to launch green travel packages, increase market exposure, and enhance customer loyalty, further improving the brand's market recognition. Finally, government support and policy guidance are key factors in optimizing green tourism hotel management. Under the promotion of the low-carbon economy, the government should support the development of green tourism hotels through policy guidance and fiscal incentives. For example, the government can introduce green building subsidy policies, tax reduction measures, and encourage hotels to carry out green renovations and technological upgrades. Additionally, the government should strengthen the promotion of green hotels to increase consumer awareness of green tourism hotels. With the joint efforts of government policies and market forces, green tourism hotels can stand out in competition and rapidly achieve low-carbon transformation. Overall, optimization strategies for green tourism hotel management under a low-carbon economy should address multiple aspects, including improving

energy management and energy-saving technology application, enhancing green building design and technological innovation, promoting intelligent management and green services, raising environmental awareness among employees and customers, strengthening green marketing and brand building, and seeking government support and policy guidance. Through the implementation of these comprehensive strategies, green tourism hotels can not only improve their environmental efficiency and market competitiveness but also contribute to the development of the global low-carbon economy [10].

4. Case Analysis and Practical Recommendations

To better understand the optimization strategies for green tourism hotel management in the context of a low-carbon economy, the following is an analysis of a typical green tourism hotel case, along with corresponding practical recommendations. The "Green Mountain Resort" hotel, located in Yunnan, China, is a green tourism hotel dedicated to sustainable development. Since its opening, the hotel has adhered to environmental protection principles, making significant efforts in energy management, resource utilization, green building design, and customer service. The hotel's building features double-glazed windows, green roofs, and solar water heaters, along with a rainwater harvesting system. During its operation, the hotel has introduced intelligent temperature control systems and LED lighting to reduce energy consumption. In addition, the hotel regularly conducts environmental protection activities to raise employee and customer awareness of green practices, and actively promotes eco-friendly consumption. Although the hotel has achieved certain success in green operations, it also faces challenges such as high operational costs and outdated green technology. By analyzing the practices of the "Green Mountain Resort" hotel, valuable insights can be provided for other green tourism hotels. In terms of energy management and technological application, the "Green Mountain Resort" hotel has made significant progress, particularly in reducing carbon emissions and improving energy efficiency. By using solar water heaters and intelligent temperature control systems, the hotel has been able to achieve efficient energy use to some extent. However, the hotel's energy management system is somewhat outdated. Although the intelligent management system can monitor energy usage in real-time, its algorithms and hardware upgrades need improvement. Additionally, the hotel still relies on traditional energy sources and has not fully transitioned to renewable energy, which means its overall energy structure still has room for improvement. To enhance energy management efficiency and reduce reliance on traditional energy, the hotel should focus on upgrading its intelligent energy management system, adding more real-time data monitoring and optimization features. At the same time, the hotel should actively incorporate more renewable energy sources and gradually reduce its reliance on traditional energy, facilitating a comprehensive green energy transition. In terms of green building design and technological innovation, the hotel has already adopted many green measures, such as double-glazed windows and green roofs, which have effectively reduced the building's energy consumption. However, the hotel still lags behind in some areas of technological innovation, especially in the use of green building materials and retrofitting existing facilities. Although the hotel has received green building certification, there are still many areas for improvement, such as the use of energy-efficient air-conditioning systems and advanced rainwater recycling technologies. To further enhance the building's green performance, the hotel can retrofit older facilities by adopting more efficient green technologies, such as energy-saving air-conditioning systems and high-efficiency heating and cooling systems. Furthermore, the hotel should improve the environmental standards of the materials it uses, selecting more low-carbon materials to further enhance the building's green performance. In terms of intelligent management and green services, the hotel has implemented intelligent management systems using Internet of Things (IoT) technology to manage guest rooms, public areas, and dining services, optimizing energy usage and providing more accurate customer services. However, the cost of implementing intelligent

systems is relatively high, and the need for skilled technicians poses a challenge to the widespread adoption of these systems. Additionally, the promotion of green services is still in its early stages, and many customers are unaware of the hotel's green service options, such as eco-friendly dining and the reduction of paper products. To further expand the adoption of intelligent management, the hotel can partner with technology companies to introduce more affordable and widely accessible intelligent service solutions. Additionally, the hotel should strengthen the promotion of green services, raising customer awareness about the environmental benefits and encouraging guests to actively choose eco-friendly options during their stay. In terms of raising employee and customer awareness of green practices, the hotel has effectively increased employee environmental consciousness through regular training and incentive mechanisms, ensuring the implementation of green management measures. At the same time, the hotel has taken several steps to enhance customer awareness of green practices. However, as customer awareness of environmental protection is inconsistent, some guests have not actively participated in green initiatives. To further enhance employee and customer awareness, the hotel can expand its environmental training programs for staff and introduce more incentives to ensure the effective implementation of green management measures in daily operations. Additionally, the hotel should use social media and its website to educate customers on eco-friendly practices, encouraging them to voluntarily choose green options, such as selecting eco-friendly rooms or participating in green activities.Through the case analysis of the "Green Mountain Resort" hotel, it can be seen that optimizing the management of green tourism hotels in a low-carbon economy requires multiple approaches, including energy management, building design, intelligent management, and green services. Despite facing challenges, the hotel has made significant achievements through proactive technological applications and innovation. Other green tourism hotels can learn from the successful practices of the "Green Mountain Resort" and tailor them to their specific operating environments and market needs to effectively promote green transformation and achieve sustainable development. By upgrading intelligent energy management systems, fully implementing green technologies, and promoting green services, green tourism hotels can enhance their environmental efficiency and market competitiveness, contributing to the development of a global low-carbon economy.

5. Conclusion

Driven by the low-carbon economy, green tourism hotel management faces significant opportunities and challenges for transformation. By improving energy management, promoting green building design, adopting intelligent management, and strengthening green marketing, green tourism hotels can not only reduce operating costs and carbon emissions but also enhance their market competitiveness. However, the industry still faces issues such as high costs, limited technology applications, and insufficient environmental awareness among employees and customers. Addressing these issues requires efforts from policy support, technological innovation, staff training, and customer education. Overall, the development prospects for green tourism hotels are promising. As the low-carbon economy and sustainable tourism continue to advance, green hotels will become an important direction for the industry's development and contribute to achieving global sustainable development goals.

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