



# Analysis of the Impact of Zero-Carbon Tourism Facility Construction on Study Tourism

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**Abstract.** As the global climate continues to deteriorate, “tourism” plays a crucial role in the ecological cycle. Nowadays, the construction of zero-carbon tourism facilities has become a key area to promote the sustainable development of tourism. This paper first summarizes the development status of zero-carbon tourism facilities at home and abroad, and explores the challenges and opportunities faced by zero-carbon tourism facilities in the construction process through specific case studies. It is found that the construction of zero-carbon tourism facilities has a significant effect on reducing carbon emissions from tourism activities and can enhance the international image and market competitiveness of tourism destinations. This paper suggests that the government should formulate more incentive policies and subsidies, and encourage tourism enterprises to research scientific and feasible policy measures to promote the construction and progress of zero-carbon tourism facilities, enrich the experience of study tours, and jointly promote the realization of the goal of “sustainable tourism”.

**Keywords:** zero-carbon tourism facilities; study tour; sustainable development; carbon emissions; technological innovation; policy support

## 1 Introduction

On September 25, 2015, the United Nations put forward the Sustainable Development Goals (SDGs), which contain 17 major goals and 169 sub-goals, which collectively articulate the many challenges faced by mankind on a global scale. The eleventh, twelfth and thirteenth goals focus on key areas such as “sustainable cities and human settlements”, “sustainable consumption and production patterns”, “urgent action to address climate change and its impacts”, and so on. “The key areas are

Under the umbrella of the Sustainable Development Goals, the United Nations World Tourism Organization (UNWTO) is committed to providing technical support and building capacity to achieve the tourism-related Sustainable Development Goals. Currently, the tourism industry, a key component of the global economy and trade, is experiencing an unprecedented test of its growth model. For example, the issue of carbon emissions in the tourism industry is in the global spotlight. Obviously, the

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construction of zero-carbon tourism facilities has become a new trend in the development of international tourism business as an effective way to reduce carbon emissions in the tourism industry and achieve sustainable development. This study aims to analyze the development trend of zero-carbon tourism infrastructure at home and abroad, explore its construction practice cases, and further analyze the challenges and opportunities it brings to the field of study and research travel, so as to provide theoretical references and strategic suggestions for the sustainable development of the cultural tourism industry.[1]

## **2 Interpretation of Zero-Carbon Tourism Facilities and Policy Analysis of Study Tour Education**

### **2.1 Interpretation of Zero-Carbon Tourism Facilities**

The concept of zero-carbon tourism facilities involves the comprehensive use of low-carbon technologies and management strategies to achieve zero or net-zero greenhouse gas emissions during the operation of tourism facilities. Such facilities not only aim to reduce carbon emissions during the operational phase, but also compensate for the remaining emissions by increasing their carbon sink capacity, in order to achieve the goal of “carbon neutrality”.

This design concept has led to new requirements and challenges in the field of tourism facilities. Firstly, the design and construction of tourism facilities must pay more attention to environmental protection and energy saving, such as adopting green building materials, optimizing energy efficiency and increasing the use of renewable energy. Secondly, there is also a need to change the mindset of the operation and management of tourism facilities, so as to reduce the negative impacts of tourism activities on the environment by promoting low-carbon tourism products, increasing the recycling rate of resources and enhancing the education of tourists on environmental protection awareness. [2]

### **2.2 Interaction and Role of Zero-Carbon Tourism Facilities and Study Tourism Based on the Dual-Carbon Background**

The combination of dual-carbon policy and research education policy provides a favorable policy environment for the integrated development of zero-carbon tourism facility construction and research travel. On the one hand, the dual-carbon policy encourages the adoption of environmentally friendly and energy-saving technologies in tourism facilities, which coincides with the educational goals of study tours. By integrating visits and experiences of zero-carbon tourism facilities in study tours, students can understand and learn environmental protection knowledge more intuitively, and improve their environmental protection awareness and practical ability.[3] On the other hand, the implementation of the study and education policy provides more market opportunities for zero-carbon tourism facilities. With the popularization and development of study tours, more and more schools and families are willing to

choose tourism facilities with environmental characteristics as study destinations. This not only helps to increase the popularity and attractiveness of zero-carbon tourism facilities, but also brings more economic benefits to them.

### **3 Challenges and Opportunities of Zero-Carbon Tourism Facility Construction**

Challenges facing the construction of zero-carbon tourism facilities mainly include technology costs, market acceptance, and policy support. First, the application of low-carbon technologies and equipment often requires high upfront investment, which is not a small burden for tourism enterprises. Secondly, market acceptance of zero-carbon tourism facilities has yet to be improved, and education and publicity are needed to enhance consumers' environmental awareness. Finally, policy support is crucial for the construction of zero-carbon tourism facilities, and more incentive and subsidy policies need to be provided by the government. [4] However, the construction of zero-carbon tourism facilities also faces great opportunities. With the global concern about climate change and the strengthening of countermeasures, zero-carbon tourism facilities will become a new trend in tourism development. In addition, with technological advances and cost reductions, the construction and operation of zero-carbon tourism facilities will become more feasible and economical. Finally, the construction of zero-carbon tourism facilities will help to enhance the international image and communication to improve the competitiveness of tourism destinations and attract more environmentally conscious tourists.

Moreover, the growing demand for sustainable travel experiences presents a significant opportunity for zero-carbon tourism facilities. As more travelers prioritize eco-friendly options, destinations that invest in zero-carbon infrastructure can differentiate themselves in a competitive market. Collaborative efforts between public and private sectors can further accelerate progress, such as partnerships for research and development of innovative low-carbon technologies. Additionally, zero-carbon tourism facilities can serve as educational hubs, raising awareness about sustainability and inspiring visitors to adopt greener practices in their daily lives. By addressing challenges through strategic planning and leveraging emerging opportunities, the tourism industry can pave the way for a more sustainable and resilient future.

### **4 Impact Analysis of Zero-Carbon Tourism Facilities on Study Tourism**

#### **4.1 Positive Impact of Zero-Carbon Tourism Facilities on Study Tourism**

Zero-carbon tourism facilities provide a green and clean learning environment for study tours by adopting environmentally friendly and energy-saving technologies, improving the efficiency of energy resources, enhancing recycling, and realizing en-

ergy saving and emission reduction. Such an environment not only helps raise students' awareness of environmental protection, but also allows them to learn and experience a green and low-carbon lifestyle in practice. [5] The construction of zero-carbon tourism facilities has enriched the curriculum and activities of study tours. For example, through the development and design of green and low-carbon themed study tours, specialty bases, and other series of products, local green and low-carbon experiences and advanced technologies have been widely disseminated, and the brand image of green and low-carbon study tours has been shaped. These activities can not only enhance students' practical ability, but also stimulate their desire for exploration and spirit of innovation.

Moreover, zero-carbon tourism facilities serve as living laboratories where students can observe and interact with cutting-edge sustainable technologies, such as solar panels, wind turbines, and water recycling systems. This hands-on exposure fosters a deeper understanding of the principles of sustainability and the importance of reducing carbon footprints. Additionally, the integration of zero-carbon practices into study tours encourages collaborative learning, as students work together to solve real-world environmental challenges. This collaborative approach not only strengthens teamwork skills but also cultivates a sense of global citizenship, as students recognize their role in addressing climate change. Furthermore, the emphasis on zero-carbon tourism aligns with global sustainability goals, making study tours more relevant and impactful in preparing students for future careers in green industries. By immersing students in such innovative environments, zero-carbon tourism facilities play a pivotal role in shaping the next generation of environmentally conscious leaders.

#### **4.2 Potential Risks of Zero-Carbon Tourism Facilities for Study Tourism**

The construction and operation of zero-carbon tourism facilities require high costs, which may lead to an increase in the cost of study and learning travel, thus affecting its popularity and accessibility. In addition, the management and maintenance of zero-carbon tourism facilities require specialized skills and talents, which may affect the safety and effectiveness of study tours if not properly managed. The construction and operation of zero-carbon tourism facilities may have some impact on the local ecological environment. For example, if the protection of natural resources is neglected in the construction process, it may lead to ecological damage, thus affecting the quality and effectiveness of study tours. Therefore, the protection of the ecological environment needs to be fully considered in the construction and operation process. The construction and operation of zero-carbon tourism facilities require policy and market support. Insufficient policy support or low market demand may make it difficult to sustain the construction and operation of zero-carbon tourism facilities, thus affecting the stability and sustainability of research and study travel.

Furthermore, the reliance on advanced technologies in zero-carbon facilities poses a risk of technical failures or inefficiencies, which could disrupt study tour activities and diminish the overall experience. For instance, malfunctioning renewable energy systems or inadequate waste management processes could undermine the educational

goals of the tours. Additionally, the high initial investment and operational costs may deter smaller institutions or organizations from adopting zero-carbon practices, limiting the scalability and widespread adoption of such facilities. This could create disparities in access to high-quality, sustainable study tour experiences, particularly for underfunded schools or communities. Another concern is the potential for "green-washing," where facilities may claim to be zero-carbon without fully adhering to sustainable practices, misleading students and educators. To mitigate these risks, it is essential to establish rigorous standards, provide adequate training for staff, and ensure transparent monitoring and evaluation of zero-carbon initiatives. By addressing these challenges, the long-term viability and educational value of zero-carbon tourism facilities can be safeguarded.

### **4.3 Exploration of Low-Carbon Tourism Influencing Factors**

The influencing factors of low-carbon tourism mainly include tourists' motivation, attitude, environment, environmental education, cognition, and willingness to participate in low-carbon tourism. Tourists' motives and attitudes towards low-carbon tourism are key factors in promoting low-carbon tourism behavior. When tourists have positive attitudes and strong motivations towards low-carbon tourism, they are more likely to adopt low-carbon tourism behaviors. The construction of a low-carbon tourism environment also has an important impact on tourists' perception and willingness to participate. A good low-carbon tourism environment can provide specific conditions for practicing low-carbon behaviors, thus promoting tourists' low-carbon tourism behaviors. Low-carbon environmental education, on the other hand, can promote tourists' participation in low-carbon life and low-carbon environment construction by improving their cognition and self-awareness of the low-carbon environment, and cultivating low-carbon qualities and abilities. However, the implementation of low-carbon tourism behavior is also affected by other factors, such as the personal characteristics of tourists, tourism supply products, and the policy and market environment of the tourist destination. Therefore, to promote the development of low-carbon tourism, it is necessary to consider these factors comprehensively and adopt diversified strategies and measures[6].

In addition to these factors, the role of technology and innovation cannot be overlooked. Advanced technologies, such as smart energy management systems, electric transportation, and digital platforms for carbon footprint tracking, can significantly enhance the feasibility and appeal of low-carbon tourism. For example, mobile apps that provide real-time information on carbon emissions and suggest low-carbon travel options can empower tourists to make more sustainable choices. Moreover, collaboration among stakeholders, including governments, tourism operators, and local communities, is crucial for creating a supportive ecosystem for low-carbon tourism. Policies that incentivize sustainable practices, such as tax breaks for eco-friendly businesses or subsidies for renewable energy projects, can further drive the adoption of low-carbon tourism. Additionally, raising awareness through media campaigns and educational programs can help shift public perception and encourage more tourists to embrace low-carbon travel. By addressing these multifaceted factors, the tourism

industry can move closer to achieving its sustainability goals while providing meaningful and enriching experiences for travelers.

## 5 Conclusion

Zero-carbon tourism facilities, as an emerging development trend in the tourism industry, has become a guidepost for the development of the tourism industry. As a form of education, study tours should pay more attention to cultivating students' environmental awareness and practical operation ability. By participating in the practical activities of zero-carbon tourism, students can directly experience and deeply understand the core value of low-carbon, and then cultivate their emotions in the field of ecosystem protection. At the same time, by strengthening inter-regional cooperation, optimizing the policy system of both, increasing policy support and scientific research and innovation processes in various regions, and creating study tour brands with regional characteristics, study tours give full play to their role in cultural heritage and environmental education.

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