

Renewable energy in the tourism sector of the Canary Islands

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Abstract

This article examines the role of renewable energy in transforming the tourism sector of the Canary Islands, a region recognized globally for its innovation in sustainable energy practices. With tourism as the primary economic driver, the islands have prioritized renewable energy to reduce environmental impact and improve economic resilience. Notable initiatives include the increasing use of solar and wind power in hotels and resorts, electric buses and low-emission transport in public and tourist services, and advanced energy storage solutions such as the Chira-Soria hydroelectric plant. The islands of El Hierro and Gran Canaria are leading examples, with El Hierro's wind-hydro power plant providing nearly all its electricity. The transition is supported by government policies, including incentives for renewable energy adoption and infrastructure development. Despite challenges such as energy storage during periods of low sun or wind, the islands' commitment to renewable energy aims for 60% renewable energy by 2030 and 100% by 2050. This transformation positions the Canary Islands as a model for sustainable tourism, enhancing both environmental stewardship and economic stability.

Keywords: tourism, renewable energy, Canary islands.

1 Introduction

The Canary Islands, located in the Atlantic Ocean, have become a global leader in integrating renewable energy into their tourism sector. As one of the world's most popular tourist destinations, the region faces unique challenges due to its reliance on tourism and its geographical isolation. The need for sustainable energy solutions has become paramount, both to reduce the environmental impact of tourism and to ensure the long-term economic viability of the islands. Renewable energy sources, particularly solar, wind, and hydro power, have emerged as key components in this transition. Hotels, resorts, and public transportation systems are increasingly adopting green energy solutions to reduce carbon emissions and operational costs. Notable projects like El Hierro's wind-hydro power plant and Gran Canaria's Chira-Soria hydroelectric plant demonstrate the islands' commitment to achieving energy self-sufficiency. With ambitious goals to reach 100% renewable energy by 2050, the Canary Islands are striving to become a model of sustainable tourism and clean energy innovation. This paper explores the key initiatives driving renewable energy adoption in the region's tourism sector and their potential for transforming the islands into a more sustainable and eco-friendly destination. [1] [6]

2 Theoretical aspects of AES

Renewable Energy in the Tourism Sector of the Canary Islands.

The Canary Islands are a global example of renewable energy innovation, especially in the tourism sector. Given the islands' unique reliance on tourism and their isolated position in the Atlantic, renewable energy has become

both an environmental necessity and an economic advantage.

Renewable Energy in Tourist Accommodations and Hotels.

Many hotels and resorts in the Canary Islands are increasingly investing in renewable energy sources, particularly solar and wind power. This transition has been supported by government incentives, such as tax credits and subsidies, helping hotels minimize their carbon footprint and reduce operational costs. For instance, Gran Canaria's new laws now allow solar energy production at a residential and commercial scale, ending previous restrictions on self-generation

Clean Energy in Transport.

The Canary Islands are also transforming public and tourist transportation. Electric buses and low-emission vehicles have become more common on islands like Tenerife, helping to reduce pollution in high-traffic tourist zones. Some islands are experimenting with advanced infrastructure; Gran Canaria, for example, is working on a large water reservoir system to stabilize its wind energy supply by pumping water to generate hydropower as a backup. [3] [7]

3. Notable Sustainable Initiatives: El Hierro and Gran Canaria.

El Hierro: Often referred to as "The Sustainable Island," El Hierro is almost entirely powered by renewable energy sources. Its wind-hydro power plant at Gorona del Viento supplies electricity to the island's residents, showcasing an ideal model of clean energy that minimizes CO₂ emissions and sustains the local ecosystem.

Gran Canaria: Another key project on this island includes the Chira-Soria hydroelectric plant, which will store

excess wind energy and use it during periods of low wind, creating a self-sustaining energy cycle

These initiatives not only reduce the tourism sector's environmental impact but also position the Canary Islands as a leader in sustainable tourism practices. Renewable energy's integration into both accommodations and transport aligns with the region's broader goal of achieving 60% renewable energy by 2030 and 100% by 2050. [4] [5]

4. The transition to renewable energy in the tourism sector of the Canary Islands

It includes initiatives in transport, accommodation and services, aimed at minimizing dependence on fossil fuels. This effort is fundamental in an intensive tourist context, since the island currently consumes 98% of energy based on fossil fuels, while renewable energy barely represents 6% of its energy mix.

Infrastructure in hotels and accommodations: Hotels and other accommodations are investing in self-supply solutions through solar panels and energy management systems. However, the need to store energy to cover periods without sun or wind remains a challenge. The Soria-Chira project in Gran Canaria, which consists of a water storage system that takes advantage of wind energy to pump water and generate electricity when necessary, seeks to solve part of this need (Frontiers, 2021; Gran Canaria Info, 2024).

Electric mobility and bioenergy: Transport in the Canary Islands, a key component of sustainability in tourism, is being transformed with the implementation of ultra-fast charging stations for electric vehicles and the use of biofuels in aviation and maritime transport. Companies such as Cepsa and the Canary Islands government are promoting the electric charging infrastructure to reach the goal of one million electric vehicles by 2040.

Innovation in renewable energy and storage: Long-term planning also includes explorations in geothermal energy and wave energy, thanks to facilities such as the PLOCAN platform in Gran Canaria. This platform allows the development and testing of new technologies for

generation and underwater energy transport, contributing to greater energy self-sufficiency of the archipelago (Gran Canaria Info, 2024).

For the tourism sector of the Canary Islands to be sustainable and efficient, the government and the private sector plan a significant investment in clean energy and storage. These combined efforts could allow the region to approach its goal of 100% renewable energy by 2040, minimizing the environmental impact of tourism and strengthening its attractiveness as an ecological destination. [2] [7] [8]

5. Conclusions

The transition to renewable energy is playing a pivotal role in transforming the Canary Islands into a model of sustainable tourism. By integrating solar, wind, and hydroelectric power across accommodations, transport, and infrastructure, the region is reducing its dependence on fossil fuels and mitigating the environmental impact of its tourism-driven economy. Notable initiatives, such as El Hierro's wind-hydro power system and Gran Canaria's Chira-Soria project, demonstrate the islands' commitment to energy self-sufficiency and innovation.

Government policies and private sector investments are driving advancements in clean energy adoption, electric mobility, and storage technologies, ensuring long-term energy security. Despite challenges like energy storage and the need for technological innovation, the Canary Islands have set ambitious goals to achieve 60% renewable energy by 2030 and 100% by 2050. This commitment not only strengthens the islands' ecological credentials but also enhances their competitiveness as a sustainable tourism destination. Ultimately, the Canary Islands' renewable energy initiatives provide a blueprint for other regions seeking to balance economic growth with environmental stewardship. [1] [2] [4] [6]

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