

ECONOMIC IMPACT OF THE CIRCULAR ECONOMY ON THE DEVELOPMENT OF TOURISM OFFERINGS IN RELATION TO ENVIRONMENTAL AND ENERGY EFFICIENCY

Example: DEVELOPMENT OF A TOURISM VEHICLE - ELECTRIC CARRIAGE

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Abstract:

The circular economy, when applied to the development of tourism offerings, enhances sustainability through waste reduction, rational resource use, and innovative solutions such as electric carriages. This paper explores the impact of the circular economy on tourism, with a specific focus on sustainable practices such as recycling, the use of renewable energy sources, and the promotion of environmentally friendly modes of transport.

The key contribution of this work is the concept of developing electric carriages, which combine tradition, technology, and sustainability. The introduction of electric carriages into tourism offerings creates a synergy between historical heritage and contemporary ecological demands, thereby increasing the attractiveness and economic potential of tourist destinations.

Keywords: *circular economy, sustainability, electric carriages, tourism, innovations*



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1 INTRODUCTION

On the western slopes of Medvednica, hidden from prying eyes in a green oasis of peace and quiet, there is a renovated old farm, only a twenty-minute drive from the center of Zagreb. This unique property, located on almost 8,000 square meters on the edge of the Medvednica Nature Park, serves tourist purposes through an innovative concept of circular economy.

The estate includes indigenous traditional houses for the accommodation of guests, a unique indigenous object, i.e. an event gallery with fifty seats for various events, a wellness/spa zone with a hydromassage pool and an infrared sauna located in a century-old barn, a glamping zone for camping in a luxury tent.

A total of 16 accommodation units in authentic, renovated buildings equipped with modern technologies. Most of the accommodation is in converted log cabins, while the glamping area includes two buildings built on load-bearing structures from old wooden beams. The first glamping facility is in operation, and the second is in the final stages of construction, and it is a two-story glamping facility that will be the first facility of its kind in the world.

Photos 1: Property overview

Entrance metal door with elements found on the property / Renovated house from 1840
Glamping tent / Spa/wellness area (sauna and hydromassage pool)



Source: Author's photo library

The special charm of the estate is made up of unique handmade items, from furniture to chandeliers and artistic details. Every object has a story - a chair is not just a chair, and a table is not just a table. They are complemented by collectible artefacts from various parts of the world, which give the space additional value. The property combines tradition, sustainability and luxury, providing guests with an unforgettable experience.

Photos 2: Interior decoration of the house (table, fireplace, wooden staircase and wall, room with wooden bed and canopy)



Source: Author's photo library

One of the main attractions of the property is the collection of carefully and thoroughly restored historical royal electric carriages, which bears witness to the rich history and serves as the central theme of this work.

Photos 3: Electric carriages on the estate - 3 that we present in this paper and others in preparation for the future tourist offer



Source: Author's photo library

2 DEVELOPMENT OF ELECTRIC CARRIAGES THROUGH THE DEVELOPMENT OF CIRCULAR ECONOMY

2.1 The origin of the idea of an electric carriage

The idea arose based on the information from the IUT congress, where the topic of historic carriages in private ownership was discussed, we started researching the possibility of buying such a carriage through a company. After the successful acquisition, the carriage was transported to the Republic of Croatia, where preparations for its repair and restoration began. The goal was to adapt it for tourist purposes, with the use of grants from various sources, thus expanding the company's business activities.

The key inspiration of the project is the preservation and revitalization of the original historical carriages, which are at the transition between functional means of transport and museum exhibits. The goal is to infuse them with the "spirit of the new age" through contemporary design and adaptation, while preserving their historical and cultural value. The project combines tradition and innovation, using long-standing professional competence in combination with modern technological solutions, thus creating a unique product with an emphasis on sustainability and historical heritage.

The author of this work, together with his collaborators, actively participated in all phases of project development, which includes planning, restoration, implementation of new technologies and continuous improvement of the project in accordance with modern ecological and technological standards.

The restoration process included reparation and mechanical and electronic equipment of

the carriage, whereby all original parts were preserved, and a dozen excellent craftsmen and artisans participated in the process, who worked together to restore the carriage to its former glory.

The restored carriage is now adapted to the tourist offer, including tourist rides, promotional activities, weddings and other events. Thus, it became not only an attractive part of the tourist content, but also a symbol of the preservation of cultural heritage in a modern context.

2.1.1 Synergy of tradition, technology and sustainability

A new type of vehicle - a new value - was created with the basic principles of the circular economy, a thorough conservation renovation, and the imputation of previously unseen technological solutions. By installing an electric drive and using the most modern joystick control technologies, GPS guidance and internal video communications, we have achieved a synergy of the past, present and future within an authentic historical vehicle. Our priority was to keep the shape and appearance of the vehicle as authentic as possible, and to use the most necessary interventions to affect the authenticity and originality as little as possible.

Electric carriages are fully in accordance with the strictest environmental standards, but also with the demands of animal protection associations and activists, that horses are no longer used in urban environments that are not at all suitable for them.

Carriages are also a powerful "marketing tool". They are extremely attractive when driving and extremely interesting for the media, in general for people to take pictures and share impressions via social networks. Due to its uniqueness and all of the above, the inclusion of electric carriages in the tourist offer provides users with an

exclusive experience, and business associates a new competitive, marketing-economic and tourist improvement.

2.1.2 Characteristics of the electric carriage

As the driving system of the carriage, instead of a horse-drawn carriage, an electric motor was installed. The energy source is non-flammable accumulator batteries, while the control method is solved by a modern electro-hydraulic system using a joystick - a miniature handle for guidance.

Photos 4: Management system



Source: Author's photo library

While the drive and control system are contemporary, all other elements of the carriage remain true to the original, preserving the authenticity of the era when horse-drawn carriages were used. When it is in motion, the historic sound of the carriage is heard through the speakers, and when the horn is pressed, the sound of the horse swaying is heard. In the passenger compartment, four screens are installed that display the attractions of the driving location in six languages, providing added value to the tourist experience. The space once intended for tools (chest) has been converted into a cooler for drinks, thus maintaining functionality with a modern addition.

About 2,000 hours of work were spent on the restoration of one carriage, including about half a kilogram of gold for the gilded parts – the carriage is covered with gold leaf. The entire development process, from

initial renovation to today's usability, took approximately five years.

Photos 5: The interior and gilded details of the Royal Chariot carriage



Source: Author's photo library

2.1.3 Three carriages for the Republic of Croatia

The project has the working title "THREE CARRIAGES FOR THE REPUBLIC OF CROATIA", and the plan is to implement it with the support of the City of Zagreb, from which we received approval for the position for various tourist routes. Support for the project came from the Tourist Board of the Republic of Croatia and the Tourist Board of the City of Zagreb, as well as the Ministry of Tourism of the Republic of Croatia, which granted non-refundable incentive funds on two occasions, all for the purpose of increasing the diversity of the tourist offer of the City of Zagreb and the Republic of Croatia in general.

So far, a total of six carriages have been acquired, two of which have been fully restored and are in tourist function, while the third is in the preparatory phase for restoration, and the rest will be restored in the foreseeable future, which further expands the offer and potential of the project.

2.1.3.1 Royal Chariot

The carriage is an original example of a royal carriage from the first half of the 18th century from our region "Royal Chariot". Ban Josip Jelačić and His Imperial and Royal Majesty Franz Joseph I rode in it.

The carriage has been completely restored and is ready for functional use, with mostly own funds being used for its restoration, with significant support from the Ministry of Tourism and Sports and a smaller amount from European Union funds.

It is estimated that the market value of this unique carriage is around 400,000 euros. This value is based on its multiple attributes – market attractiveness, functionality, historical significance and environmental friendliness, which makes it an extremely attractive and competitive product on the sustainable tourism market.

At the same time, it gives the project the greatest charm, and it is planned to drive in the upper city of Zagreb.

Photos 6: Carriag Royal Chariot



Source: Author's photo library

2.1.3.2 Victoria

The origin of the name of this carriage is uncertain, as is the time when its production began. Thus, its dating is determined differently between the end of the 16th and the 18th century. It is certain that it was popular in the 18th century, but in the 19th it became even more popular. In the Victorian days, i.e. in most of the 19th century, the carriage was a status symbol of

its owner's success. The popularity of the carriage was not only limited to Europe, but it had the same popularity in America.

The plan is for the carriage to serve as a tourist route, providing visitors with a unique experience of traveling from the estate to the historic Zagorje castles. By incorporating an electric drive, the modernized Victoria carriage would combine the charm of tradition with the principles of sustainability, providing an environmentally friendly and unforgettable way to explore the cultural and architectural heritage of the region.

Photos 7: Victoria carriage



Source: Author's photo library

2.1.3.3 Landauer

The Landauer carriage is a classic type of carriage that was popular in the 19th and early 20th centuries, especially in Europe. This carriage was named after a German carriage manufacturer, and became a symbol of luxury and elegance of that era. It was used by the high social elite, and was a frequent sight on the streets of European cities such as Vienna, London and Paris. Today, Landauer carriages are rare and considered collectors' items.

This carriage will be used for tourist purposes, especially for organizing weddings, where it will contribute to a festive and romantic atmosphere. In addition, it can be used for various occasions such as festive events, historical reconstructions, themed tourist tours, and filming and promotions. This kind of application enables the preservation of tradition, while at the same time offering

visitors a unique and unforgettable experience.

Photos 8: Carriage Landauer



Source: Planwagen - the most popular horse-drawn carriage for tourist transport - GLINKOWSKI - CARRIAGES

CONCLUSION

The presented paper is based on the knowledge and experience gained through various scientific, business and entrepreneurial research and through a series of business and legal processes related to the registration and realization of the project, and points to the successful implementation of the principles of circular economy in the development of tourist vehicles, especially electric carriages, which combine historical heritage with modern technological solutions. The restoration and adaptation of historic carriages, with the use of renewable energy sources and innovative systems such as electro-hydraulic steering systems, highlight the importance of sustainable development in tourism. The project is continuously aligned with the European green transition guidelines, The project of arranging and equipping the carriage was not finished; it continues to be continuously supplemented and improved

in accordance with European regulations and guidelines of the green transition, which achieves a significant contribution to the preservation of the environment and increasing the competitiveness of tourist destinations, and complements the tourist offer of the Republic of Croatia.

Future plans, such as the integration of a regenerative battery charging system, further strengthen the potential of this model as an example of a successful synergy of tradition, innovation and sustainability.

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