

Available online at [www.sciencedirect.com](http://www.sciencedirect.com) ScienceDirect

Energy Procedia 5 (2011) 1974–1978

Energy

**Procedia**

IACEED2010

# The model of developing low-carbon tourism in the context of leisure economy

HUANG Can\*, DENG Hongbing

*School of Economics and Management, China University of Geosciences (Wuhan), P.R.China, 430074*

---

## Abstract

The concept of low-carbon tourism was proposed recently, which is a new way of travel to acquire higher value and travel experience for tourists and more social, economic and environmental benefits for our society by reducing carbon emissions occurred in tourists' activities. In this paper, the author gives the theory and practice status of low-carbon tourism, establishes the developing model of low-carbon tourism in the context of leisure economy by choosing the direction, the path and the methods, and further puts forward the specific measures of developing low-carbon tourism in China.

© 2011 Published by Elsevier Ltd. Open access under [CC BY-NC-ND license](http://creativecommons.org/licenses/by-nc-nd/3.0/).

Selection and peer-review under responsibility of RIUDS

*Key words:* Leisure economy, low-carbon tourism, model;

---

## 1. Introduction

As a human pursuit, leisure has caused great concern to the governments since the new period of leisure comes. People who participate in social work around the world will spend 50% more time per year for leisure in the next 15 years. According to the survey, one third of the Americans' time is used for leisure, one third of their income for leisure and one third of their land for it<sup>[1]</sup>. Meanwhile, tourism, as a form of relaxation, has been accepted widely, and with the continued development of the world economy, the leisure economy will play the key part in tourism industry. Leisure-tourism industry will also become the first major industry of the tertiary industry.

However, tourism is generally viewed as a highly consumptive industry with a substantial share of destinations operating at less desirable eco-efficiency values than the global average (Gössling et al., 2005)<sup>[2]</sup>. Although it is an active and healthy lifestyle, the event of tourism is based on the high cost of resource consumption with the rapidly increasing consumer demand. The behavior of tourists' consumption shows

---

\* Corresponding author. Tel.: +8615207187793.

E-mail address: [huangcan334@163.com](mailto:huangcan334@163.com).

characteristics of non low-carbon obviously<sup>[3]</sup>. And accompanied by the increasing scale of tourism, it is responsible for energy supply shortage, carbon emissions increase, climate change and other global problems of resources and environment. Thus it has a great significance to develop low-carbon tourism.

## 2. Review on theory and practice of low-carbon tourism

### 2.1. Theory of low-carbon tourism

Low-carbon tourism is a new way of consumption which is developed following the low-carbon economy. The concept of low-carbon economy was first proposed in *Our Future Energy — to create a low-carbon economy* by the British in 2003. It is said in the *Energy White Paper* that low-carbon economy is trying to create higher standards of living by less consumption of natural resources, less environmental pollution and more economic output<sup>[4]</sup>.

The concept of low-carbon tourism was formally proposed in the report of *going to low-carbon travel and tourism industry* on World Economic Forum in May 2009. Theoretical studies on low-carbon tourism are few. Stefan Gössling<sup>[5]</sup> discussed the food management of tourism development from the perspective of tourists' carbon footprint, making the conclusion that the effective food management will reduce the tourists' carbon footprint. Richard S., J Tol<sup>[6]</sup> discussed the impact on international tourism by carbon emissions taxation, and then put forward that the different amount of taxations on carbon emissions would change the tourists' behavior in the transport of air travel. Paul Peeters<sup>[7]</sup> forecasted the data of 2035 and 2050 about carbon emissions based on the data of 2005, trying to find the way to reduce carbon dioxide emissions. Cai Meng, Wang Yuming<sup>[8]</sup> proposed the concept of low-carbon tourism, and gave a model of low-carbon tourism response to the low-carbon economy. Zheng Qi<sup>[9]</sup> distinguished the concept of low-carbon tourism from broad and narrow perspectives.

### 2.2. The practice status of low-carbon tourism

Low-carbon tourism has shown a boom around the world over the years. For example, Copenhagen has taken 50 measures to build a low-carbon city, one of which is taking full use of abundant wind energy in Denmark. Low-carbon hotels have been launched in many countries as well, such as Ton Sai Bay Hotel in Koh Samui, Thailand. and the luxury and romantic Banyan Tree Resort in Bintan, Indonesia. In addition to hotels, some scientific Museums based on the theme of carbon appeared, such as the California Museum of Science. The building is environmentally friendly 70% than usual with a covered roof of California native ecological plants, which is not only ornamental, but also significantly reduces the energy consumption by air conditioning<sup>[10]</sup>.

In China, low-carbon tourism is also on the agenda and attracts much more attention than before. The most attractive one is the World Expo held in Shanghai in 2010, which has not only formulated a series of low-carbon solutions to reduce carbon emissions from the source, but also actively implemented the carbon offset measures for additional carbon emissions. Apart from that, A hotel chain in Hangzhou launched a highly innovative Low-carbon Rewards Program.

## 3. The importance for China to develop low-carbon tourism in the context of leisure economy

### 3.1. As an important direction to developing low-carbon tourism for tourism industry development

114 statutory holidays in China each year, plus paid vacation time, there are nearly one third of annual holiday time for China's urban working stuffs at leisure, which will gradually form a new requirement of

leisure lifestyle. As a result, people will have to face a new era to pursuit leisure<sup>[11]</sup>. Apart from that, the development of tourism industry in China shows a good momentum, and the number of international and domestic tourist arrivals grows rapidly.

However, the development of tourism needs the guidance of sustainable development. Thus it is necessary to insist on the direction of low carbon tourism. First of all, the characteristics of non low-carbon of the tourism industry have brought about some negative effects on the ecological environment. Secondly, the development of tourism will induce tourists to change the way of consumption, and tourism activities in the face consumption and luxury consumption would cause the increase in carbon footprint.

3.2. As an important way to respond to a low carbon economy

It has a long way to go for China to save energy and decrease carbon dioxide emissions. According to the data which was published by MNP, carbon dioxide emissions in China in 2006 ranked first in the world which was more than the United States, and in 2007, carbon dioxide emissions in China accounted for about one-quarter in the overall world. Data based on Carbon Monitoring Action (CARMA) Web site provides a comparison and ranking on carbon dioxide emissions of many countries around the world, as shown in table 1.

Table 1. Ranking on carbon dioxide emissions of top ten countries

ranking		1	2	3	4	5	6	7	8	9	10
country		America	China	Russia	India	Japan	Germany	Australia	South Africa	Britain	Korea
carbon dioxide emissions		28	27	6.61	5.83	4	3.56	2.26	2.22	2.12	1.85

(100 million tons)

The contradictions reflected on the ecological deficit, land, energy and environmental restrictive in China are becoming increasingly prominent. As a pillar industry of the modern service industry, tourism is not only a competitive industry in energy saving, but also the leading industry driving the green economy, with the characteristics of high driving, high correlation, high-radiating, etc. Therefore, it has a huge advantage for low-carbon tourism in response to low carbon economy.

4. The model of low-carbon tourism development in the context of leisure economy

The developing model of low-carbon tourism is to reduce the carbon footprint of tourists and the carbon footprint can be reduced by building low-carbon tourist attractions, allocating low-carbon tourist facilities, promoting a low-carbon way of tourist consumption and nurturing a tourist experience environment of carbon sequestration<sup>[8]</sup>.

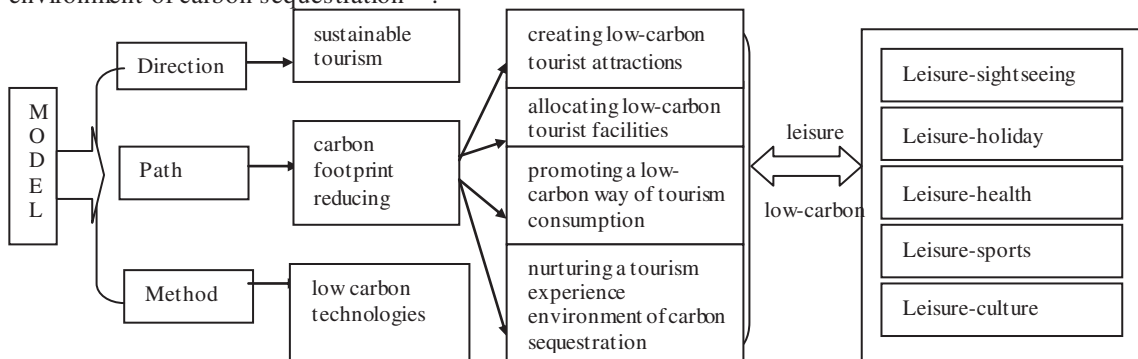


Fig. 1. The model of low-carbon tourism development in the context of leisure economy

#### 4.1. Direction ---Sustainable Tourism

The core idea of sustainable tourism is sustainability of tourism environmental development, welfare of tourism benefit and fairness of tourism opportunities<sup>[8]</sup>. To some degree, low-carbon tourism, as a way of tourism development, belongs to sustainable tourism and should take the idea of sustainable tourism to achieve the ultimate goal of sustainable development of tourism industry. It can be put into practice of sustainable tourism development, thus low-carbon tourism is much more operational and practical. The development of low-carbon tourism should adhere to the direction of sustainable tourism and carbon emissions should be controlled at a reasonable level by low-carbon technology. Thereby, tourism economic, social and environmental benefits would have a comprehensive improvement.

#### 4.2. Path --- carbon footprint reduction

The path to develop low-carbon tourism is reducing the carbon footprint by creating low-carbon tourist attractions, allocating low-carbon tourist facilities, promoting a low-carbon way of tourism consumption and nurturing a tourism experience environment of carbon sequestration<sup>[8]</sup>.

##### 4.2.1 Creating low-carbon tourist attraction

First, planning and designing the scenic area and tourist destination to form a model of recycling development on the energy with the thought of circular economy as a guide; Second, carry out eco-labeling act, repair and protect natural landscape such as forests, grasslands, beaches, maintain its original ecological state, and set low-carbon identifier; third, make the application of new energy sources as a tourist attraction, such as white windmills in Denmark and the solar farm, etc. Fourth, apply low-carbon technologies to construct low-carbon tourist attractions, such as low-carbon museums, parks and other low-carbon industrial demonstrations.

##### 4.2.2 Configuring low-carbon tourism facilities

The infrastructure of low-carbon tourism includes transportation, roads, sanitation facilities, car parks, distribution centers and energy supply facilities of low-carbon tourism, etc. The services facilities of low-carbon tourism mainly include accommodation, dining, shopping and recreational facilities. Low-carbon technologies should be applied to the tourism infrastructure and service facilities.

##### 4.2.3 Promoting low-carbon tourism consumption style

The aim of promoting low-carbon tourism consumption style is to reduce individual carbon footprint in tourist activities. Paul Peeters found that most tourist emissions are caused by transport (72%). Also, air transport alone produces 43% of total CO<sub>2</sub> emissions but is only used in 17% of the total number of tourist trips. Also these emissions are projected to grow at an average rate of 3.2% per year up to 2035<sup>[7]</sup>.

The most important way to promote low-carbon tourism consumption is to implement carbon offset program to visitors. On one hand, we can use forests, oceans, wetlands and other natural resources as a vehicle to offset carbon. For example, we can promote tourists to plant trees. In 2003, U.S. film actor DiCaprio paid for tree planting in Mexico, and claimed to be the first carbon offset citizen<sup>[10]</sup>. On the other hand, we can also pay for carbon by taxes. For example, U.S. Continental Airlines companies cooperated with International Travel Organization of Sustainable Development, a non-profit International organization, to launch carbon offsetting scheme<sup>[10]</sup>.

##### 4.2.4 Nurturing tourism experience environment for carbon sinks

It needs government, tourism enterprises, tourism communities and tourists working together to achieve the goal of nurturing the tourism experience environment for carbon sinks. In order to make a harmonious environment for low-carbon tourism experience, the government should make a mechanism

for the implementation of carbon sinks tourism, build low-carbon tourism enterprises, implement low-carbon community actions and change consumption patterns of tourists<sup>[8]</sup>.

#### 4.3. Method ---low-carbon technologies

The application of low-carbon technologies in tourism mainly lies in low-carbon buildings, low-carbon transport, low-carbon equipments, low-carbon tourist attractions, etc., focus on energy efficiency of buildings, water conservation in hotels, new energy, low-carbon transport R & D and pollution emissions controlling and other key technologies to provide technical support for low-carbon tourism.

### 5. Policies and measures to implement low-carbon tourism in China

The most important thing is to make people know that low-carbon tourism is a positive and responsible way to travel. Then study and introduce low-carbon tourism standards actively, making energy consumption and carbon emissions rules of hotels, transport, dining, recreation, entertainment. In addition, it's a good way to start some pilots of low-carbon tourist destinations like the construction of low-carbon city. There have been five famous low-carbon tourist attractions so far which are Yanzi ditch, Emei Mountain, Zhangjiajie, Shangri-La and Daxinganling.

### References

- [1] Zhou Tianyun, leisure economics: allocating of resources with leisure, foreign business issue 260, 2009
- [2] Trista M. Patterson, Valentina Niccolucci, et, al, Beyond "more is better": Ecological footprint accounting for tourism and consumption in Val di Merse, Italy, Ecological economics 62(2007)747-756
- [3] Zhang Shiman, Tourism: a healthy but non low-carbon lifestyle, Tourism Tribune 2010.9 (25)
- [4] Fu Yun, Ma Yonghuan, Liu Yijun, Niu Wenyuan, Development Patterns of Low Carbon Economy. China population, Resources and Environment, 2008, 18 (3)
- [5] Stefan Gössling, Brian Garrod, et al, Food management in tourism: Reducing tourism's carbon 'footprint', Tourism Management, (2010) 1-10
- [6] Richard S.J. Tol, The impact of a carbon tax on international tourism, Transportation Research Part D 12 (2007) 129–142
- [7] Paul Peeters, Ghislain Dubois, Tourism travel under climate change mitigation constraints, Journal of Transport Geography 18 (2010) 447–457
- [8] Cai Meng, Wang Yuming, Low-carbon Tourism: A New Mode Of Tourism Development, Tourism Tribune, 2010, 1 (5)
- [9] Zheng Qi, Low-carbon Tourism: innovative mode of low-carbon city in transition, Study and Exploration, 2010, 4
- [10] Lan Woniu, Low-carbon Tourism, a new fashion way of travel, Modern Youth, 2010, 4
- [11] Jiang Chunhong, The Enlightenment of Overseas Leisure Economy to the Development of Leisure Industry in Our Country, Journal of Jiangsu Teachers University of Technology (Communication of Vocational Education), 2009, 11(24)