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Contradictory Analysis of Energy Structure and Low-carbon Development of Sports Economy in China

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ABSTRACT

There is an important link with energy structure and low-carbon development of sport economy. In this paper, we take the connotation and characteristics of sport economy low-carbon development as the starting point, for the in-depth analysis of the relationship between energy structure and sports economy development, we find that there is a certain contradiction in the current structure of China's energy production, consumption as well as cost structure and the way of sport economy low-carbon development. This contradiction is mainly reflected in the current energy mix pollution as well as low efficiency and high green energy costs, resulting in its propulsion difficulties, which are contradicting low-carbon characteristics. For this reason, we believe that we should improve energy usage to reduce pollution on the one hand, and promote sports economic activity in green way and activity without energy or with low-energy consumption. In the meanwhile, we should keep innovating new method to reduce production costs and improve the output of green energy resource.

Key words: Energy structure, Sport Economy, Low-carbon development, Contradiction

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INTRODUCTION

China is a major consumer of energy, the insufficiency of energy development is always the important factor of economic development limitation. The insufficient of energy development in China firstly reflects in the energy structural problems. From 1978 to the present, 70% of China's energy has relied on the supply of raw coal, and presents annual increasing trend. Although the exploitation of new energy is making progress, the production is limited such as natural gas and hydropower, wind power, nuclear energy and other new energy are in the proportion to total less than 15%. This serious imbalance and the conception of the China's low-carbon development are seriously inconsistent. The contradictions of Energy structure and low-carbon development have been the main contradiction to influence economic development. Wang Zhaosheng (2012) has studied the relationship between the energy structure and economy, and found there is a dilemma between them. Both of them have low moderation and unsatisfactory fitting problems. XuLiNa (2013) empirically analyzed and approved that the energy structure impact the energy strength significantly. Zhang Lifeng (2011) analyzed the relationship between the structure of energy production, energy consumption structure and industrial structure of energy consumption and carbon emission. Low-carbon economy is a sustainable model of economic development, China's sport economy at the peak period of rapid growth, the current facing ecological problems have been very serious, and low-carbon development became the focus of social attention. Sports economy is also facing industrial transformation to low-carbon environmental ecological mode of development period. Sport economic development of low-carbon has caught the attention recently, especially the low-carbon problems of competitive sport and sport stadium construction. Some scholars have studied the low-carbon development of sport economy. Lei XianLong (2011) studied the constraints of low-carbon development of sports economy; he concluded that the important aspect is the energy structure. Kang HuiBin (2010) considered that the development of low carbon challenging the development mode of sport economy. Based on the above empirical studies, sport economy is the important part of the economy, its low-carbon development and energy structure exists serious contradiction, this paper starts at China's energy structure, including

production and consumption structure according to the basic feature of sports economic low-carbon development, take a depth analysis of the sports economy low carbon development contradiction with China's current energy structure.

THE LOW-CARBON DEVELOPMENT CHARACTERISTIC OF SPORT ECONOMY

Low-carbon conceptions apply to sports' life. Low-carbon concept of sport life is that people try to use non-polluting, low-energy way to exercise, such as riding bicycle instead of motorcycle, climbing stairs instead of taking elevator. Using of solar energy, air, natural gas instead of coal and other electricity as sports equipment, and so on. For non-polluting、artificial sport philosophy do not need to be improved by the energy structure, but related equipment production cannot without energy, such as the manufacture and transportation of sport facilities in public parks. It can be said that any part of the sport life just cannot without energy, and then the energy result will impact on it. All know that renewable energy can be used to replace, but China's energy structure determines the limited of its renewable energy, including the limited of production, consumption and import.

A variety of competitive athletic activity play a vital role for sport economic development, but many people develop serious problems of wasting energy in the competitive sports activities, such as car racing. With the attention to environmental issues, people begin to suggest the low-carbon in sport activity. Low-carbon of sport activities means that adopt the low-cost way to carry through, try to use renewable energy, try to improve the utilization of energy and so on. But China's energy structure and the defect of production technology lead that our current sport wasting energy still seriously, low-carbon and low effectiveness of physical activity.

Low-carbon conceptions apply to sport product manufacture and circulation. Sports products include sports equipment, sports venues and other activities directly related to or needed. Sports production, sales and consumption are the important parts of sports economy, and also are the largest parts of energy consumption of sporting economy. Sport products involve raw materials to manufacture of finished product, sales and consumption process that must spend a lot of energy, and energy -consuming cannot be separated with energy production, imports and consumption. Therefore, the overall situation of China's energy structure directly affect energy use in manufacture of sport product, including energy efficiency, energy use manner and the variety of energy use. Sports product manufacture and circulation of low-carbon including low-carbon production of sport product, transportation, sales, circulation. Low-carbon Production refers to the use of low-carbon energy consumption, renewable energy equipment. Low-carbon Transportation refers to the use of low-power cost, renewable new energy equipment for transport. Low-carbon Sales refers to the use of low-power consumption, renewable energy and venues to sell. Low-carbon Circulation refers to the use of low-power, low-carbon, renewable new energy distribution methods and equipment to dispatch products.

From the above analysis, sports economy development of low-carbon energy requires to improve the efficiency and reduce the pollution. On the other hand, to fully utilize clean and renewable energy, the results of which have focused on energy requirements: requires the utilization of the energy, low- polluting energy sources to enhance; requires the renewable energy from energy structure should reach a higher proportion, which can meet the energy needs of sustainable economic development in sports; requires the green energy from energy structure to achieve a certain level, thereby reducing the pollution of overall energy consumption. All in all, the development of low-carbon economy requires sports should also be low-carbon, reduce energy pollution. From the current energy efficiency, low-carbon of energy structure needs to reduce proportion of coal use, because it has a high pollution emission rates, high toxic emission, low use efficiency; that is to increase the usage of alternative green energy, such as wind, water energy, geothermal energy and other; that is to depress pollution rate, using a high proportion of the use of new energy sources, such as natural gas.

THE RELATIONSHIP BETWEEN ENERGY STRUCTURE AND SPORT ECONOMY DEVELOPMENT IN CHINA

Production structure and low-carbon sport economy. Figure 1 plots the energy production structure in China. Coal is still used as dominant and based energy in China. Its proportion has maintained a slow upward trend since 1978. Raw coal is the lowest utilization source and the largest pollution resource, largest emission of various pollutants and toxic, involving carbon dioxide, sulfur dioxide. In recent years, China's new energy like water, wind, nuclear power have maintained an upward trend, but due to lacking of technology and high production costs, it has been developing very slowly, until now its share is still less than 10%, to improve China 's energy structure for the entire role is very limited. Natural gas is the most talked about energy species in recent years, but from scale of development, its specific proportion is around 5%, but in recent years the proportion of China's crude oil has maintained a downward trend, mainly because China's crude oil resource reserve is insufficient, and the exploitation of China's crude oil capacity is limited, and energy demands large.

We can see, the structure of China's energy production is in serious imbalance, excessive dependence on coal production, and new energy, water, electricity, gas and other development is very inadequate. This production structure and the current low-carbon economic development model advocated by government are very contradictory.

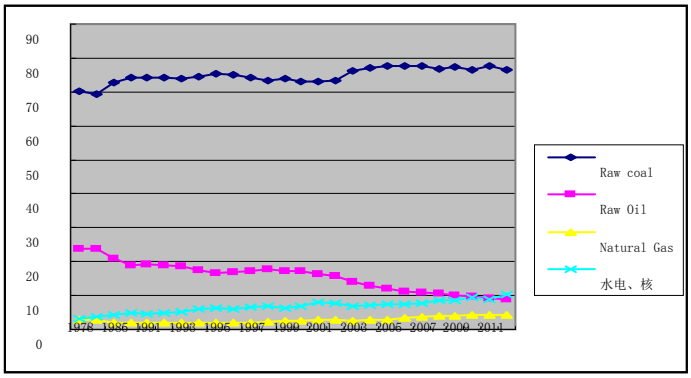

Fig. 1: China's energy production structure (1978-2012)

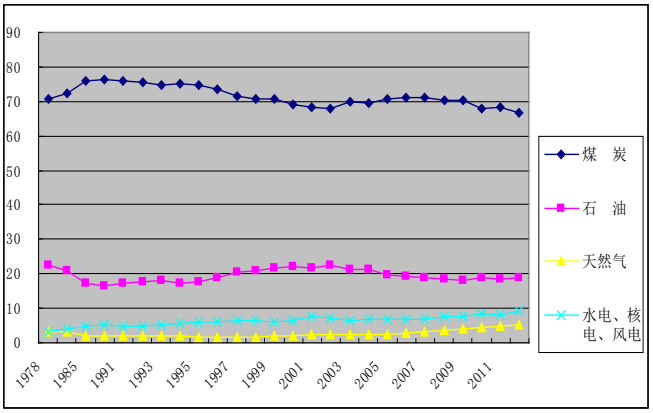

Fig. 2: Energy consumption structure in China (1978-2012)

Contradictions of Consumption Structure and Low-carbon Sports Economy Development. Figure 2 shows that China's energy consumption structure is still based mainly on coal, but there is a downward trend, the current coal consumption ratio has been below 70% mark, and is still declining, which shows that China's consumer awareness has changed a lot, consumption has shifted to other renewable energy resources. Though the proportion of crude oil usage is declining, the downward trend is insignificant a particular increasing trend in natural gas and hydropower, wind power and other new energy, the proportion of natural gas reached 10 %, water, wind and nuclear power and other new energy has reached 6%. But the new energy consumption is still less than 18%. In general, it still low, the coal consumption is still dominated.

According to above analysis, although the proportion of new energy consumption to maintain a certain upward trend, the trend is very slow, the use of the ratio is still very low, the dominance of coal in the short term cannot be changed is inevitable, so this situation will be long-term presence, it said high pollution and high- emission energy cannot be changed in long-time, which is contradictory with low-carbon development concept. Current energy development of China's sport economy is inseparable from China's overall energy consumption structure, and it cannot escape from coal -driven energy consumption, then it cannot escape from the high pollution and high emission of energy consumption structure.

The Structure of Production and Consumption and Low-carbon Sports Economy Development. Figure 3 shows that China's production and consumption remained relatively equal trend, but the growth rate of energy consumption is relatively greater than production. Figure 4 shows a proportion of the production is less than consumption [(Consumption - Production) / Consumption] trends. As we can see from Figure 4, prior to 1991, China's energy production is greater than consumption, and therefore energy is exported, but in 1992, after China's energy gap is growing, so the curve showed a significant upward trend. The imbalanced of production and consumption structure lead to a severe energy shortfall and depend on foreign energy more. Production and consumption structural imbalance because of low productivity, lack of local production, on the other hand it also shows unreasonable in

China's energy production and consumption, due to the large scale of production, but because the irrational structure, low efficiency, resulting in energy unreasonable use, leading the production cannot meet consumption.

From the proportion of the overall production and consumption, we can see that China's imports are mainly crude oil, coal, and lower import of other renewable energy resources. The current oil pollution is still very high, so the use of ratio is inevitable low, although it is a little better than raw coal, its low carbon still has a big gap compare to solar energy and other green energy.

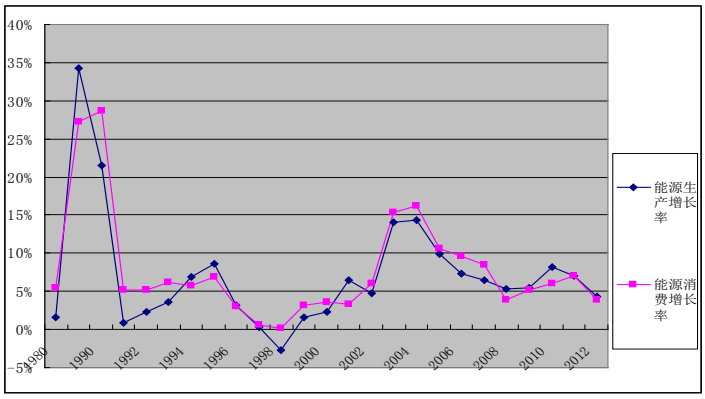

Fig. 3: China's energy production, consumption growth (1980-2012)

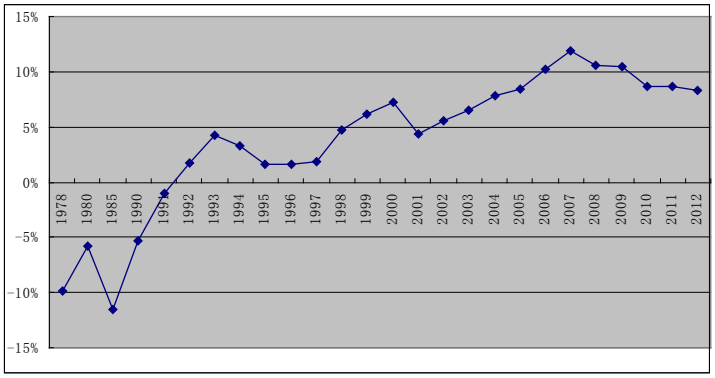

Fig. 4: China's energy gap trend (1978-2012)

The Game of Energy Cost Structure and Low-carbon Sports Economy Development. China's energy structure is mainly reflected in the production process, judging from the structure of new energy cost, greater investment in fixed assets and lower yields, which leads to a higher average cost of new energy. For example, China has a lot of wind power stations, but due to they are low productivity, high costs, and finally went bankrupt, many wind power electric devices are idle. There are also relatively cost structures, such as solar, natural gas, etc., in the presence of instability of energy supply, resulting in increased costs. There is a contradiction between costs and low-carbon. The low-carbon development of sport economy needs to consider cost problems, so there is a selective game between the carbon and cost. As table 5, assumes nine kinds of possibilities. 1: Non- low carbon and low cost, the current situation likes this, mainly adopt the way of lower cost energy development, but in a non- low-carbon development, this development that can favor rapid economic growth in sports, but not a sustainable development approach. 2: The non- low carbon and intermediate cost, this mode indicates a higher cost of overall energy. 3: The high cost and non- low-carbon development approach, which illustrate regional energy production cost is very high, this situation is not conducive to the economic development of sports. 4: Low-cost and low-carbon development approach, in this case illustrate the proportion of clean and renewable energy sources has improved greatly, while the overall cost of energy has greatly improved. 5: The intermediate cost and the intermediate low-carbon development, then there is improvement to new energy structure and its costs have reduced, clean and renewable energy have greater development. 6: The high cost and low carbon development, then development of new energy made some progress, but the high cost of production. 7: Low-carbon and low-cost development, then new energy development has made great progress, and the production costs are low. 8: The intermediate costs and the intermediate costs of development, then new energy has made great progress, and the cost is not high. 9: High cost and low-carbon development, then new energy development has made great progress, but the cost is very high.

Tab.1: Game with a low-cost development and low-carbon development

Tab.1: Game with a low-cost development and low-carbon development

Types	Non-low carbon	Medium carbon	Low-carbon
Low cost	1	4	7
Medium cost	2	5	8
High cost	3	6	9

According to the above nine possible features, as well as the current status quo and the status quo of China's energy development and economic development of sports and energy usage can be seen that China's new energy development has been developed to a certain stage, but the production costs of new energy is very high, especially low production and usage is very limited, leading to difficulties in the implementation of new energy resources. In order to achieve a certain growth rate, sports economy uses low-costs, non- carbon energy oriented way. It can be seen from table 1, if we use the low-carbon sports economy development, it will inevitably bring about a substantial increase in economic costs, these cost estimate are not grafted directly to consumer, otherwise you will lose the market, thus if the government pay the bill, otherwise it will be faced with difficult economy development and even sports economy backward. If China adopts the low-cost and low-carbon development, then it must vigorously reduce development costs of new energy sources, but this requires a long-term process. After 30 years of development, the proportion of new energy sources are very low, indicating that cannot be achieved in the short term.

CONCLUSION

As the above analysis, the low-carbon sport economy development and energy structure exist various contradictions, contradictions and conflicts with the energy cost structure, energy production structure, energy consumption structure, and energy production and consumption structure. Based on the above analysis, to promote low carbon sports economy development, should be from the following aspects:

First: Improve energy efficiency and reduce pollution level, this is mainly from the following aspects: A. Use of advanced and low power consumption, high energy utilization equipment. B. Improve the quality of energy, thereby improving energy efficiency.

Second: To promote green economy development. The construction of sports, daily physical exercise and sports building can consider the perspective of energy use to arrange, the use of low-carbon way to carry out, such as sport construction adopt low-energy material, energy-efficient lighting can be used to set or clear a convertible, thereby reducing electric energy use. People use exercise equipment can be an artificial instrument, rather than by energy –driven instrument.

Third: The innovation of new energy. Reduce production costs of green energy, improve green energy production. This is the key measure to address the development of sports in the low-carbon economy. No matter how to save and improve efficiency, it cannot solve the fundamental problem. China is a populous country, is also a big energy consumption country, if there is no alternative renewable green energy with low cost, then the high-polluting coal energy will still be heavily used. To break this situation, China must reduce the production costs of new energy.

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