

LETTER TO THE EDITOR

Design of Forecasting Model for Carbon Emission from Ecological Environment under the Law of Low Carbon Economy

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In all kinds of environmental crises faced by human beings, carbon emission is a relatively special kind, which is because of its colorless, odorless and non-toxic, the destruction of ecological environment is indirect; as a byproduct of fossil fuel, it is highly synchronized with energy consumption; Under the action of atmospheric circulation flow, the influence on the environment has crossed the national boundaries and regions to show integrity; due to the dependence of electricity on carbon-containing fuels, the reduction of carbon emissions by new energy technologies is ineffective. Therefore, under the restriction of low-carbon economic law, the coal consumption and carbon emissions from 2013 to 2017 are selected as the overall sample, and the prediction model of ecological environment carbon emissions is established, and the path of low-carbon society is constructed according to the prediction model. So that people can generally master and use low-carbon theory and skills, take the initiative, rational practice of low-carbon action.

Under the law of low carbon economy; Ecological condition; Carbon emission.

1 INTRODUCTION

At present, global warming has been considered to be the primary public hazard that threatens the survival and development of human beings. Although there are still different explanations for the causes of climate warming, there is growing evidence that large amounts of carbon dioxide emissions are the main cause of climate warming. The rapid growth of population and the economic activity of human society are the decisive factors leading to the increase of carbon dioxide concentration. With the deepening of human understanding of the law of atmospheric change, the voice of reducing carbon emissions is getting higher and higher. The environmental problems caused by carbon emissions are very different from other environmental problems in the aspects of formation causes, influence scope, mode of action, internal and external links, etc., only to recognize the essential characteristics of carbon emissions problems. In order to better promote the realization of low-carbon economy and low-carbon life, build a low-carbon society with low energy consumption, low pollution and low emissions (Khosravi et al. 2018, Guerrini et al. 2018, Vicente-Molina et al. 2018).

In 2019, Xianjia Wang, Jing Shen published an article in the journal Ekoloji (Issue 107) entitled “Enterprise Supervision Research on Carbon Emission Based on Perfect Bayesian Equilibrium”. This paper establishes a Bayesian dynamic game model between government environmental regulators and carbon emission enterprises.

This paper introduces the monitoring system as a method to master the real-time carbon emissions of enterprises for the first time, and takes into account the disclosure of carbon information by enterprises, which avoids the review by government departments. Through the model analysis, it is concluded that the accuracy of the monitoring system and whether the enterprise publishes its carbon information have a great impact on the strategic choice of both sides of the game. The research results are of great practical significance for perfecting the regulation and control policy of carbon emissions, suppressing the excessive and secret emissions of enterprises, and improving the efficiency of carbon emission regulation and control.

In this paper, a method for measuring carbon emissions of transportation enterprises based on STIRPAT model is proposed (Bai BF, Liang J2017). In view of the problem of measuring carbon emissions from transportation enterprises, it is found that it is very difficult to measure carbon emissions directly. Because of the variety and complexity of its influencing factors, we cannot consider all the factors carefully, so we need to find an alternative algorithm. Some intuitive influencing factors are ignored, and the random environmental impact assessment model is used to solve the shortcomings that carbon emissions cannot be measured directly or influencing factors cannot be predicted. In this paper, a prediction method of carbon emissions in China based on ARIMA model is proposed (Yu H2018). Through time series analysis, the ARIMA model is established, and then the model parameters and residual errors are tested and predicted respectively. through the test, the model is used to predict the carbon emissions in China. The results show that the: ARIMA (1, 1, 0) model, that is, ARI (1, 1) model, is suitable for predicting carbon emissions in China. On the basis of this model, this paper proposes and designs a prediction model of ecological environment carbon emissions under the law of low carbon economy.

2 IDEA DESCRIPTION

The legal system of low-carbon economy is a huge legal system. The analysis of the composition of the system is helpful to clarify the relationship between various laws, understand the regularity between laws, and provide a reasonable basis for the establishment of the relevant institutional system in our country. It is undoubtedly beneficial to the scientific classification of laws related to low carbon economy to establish appropriate classification standards and master appropriate classification methods (Hong K H, Jung H, Park M 2017). It is of great significance to promote the development of low-carbon economy in our country effectively. It can not only fill in the research gap in the legal classification of low-carbon economy in our country, but also help our country to make effective use of legal resources, save legal costs and improve legal efficiency. Reasonable construction of China's low-carbon economic legal system.

2.1 The necessity of constructing the legal system of low carbon economy

Low-carbon economy is a rational choice made by all countries in the world to deal with global warming. Low-carbon economy is an economy that makes up for market failure and is the inevitable product of state intervention in the economy. It is on the premise of fully respecting the market economy. A way of intervention in the economy with the tangible hand of the government, which itself embodies the characteristics of state intervention in the economy (Ji J, Zhang Z, Lei Y 2017). The construction of the legal system of low-carbon economy is not only the objective requirement for our country to fulfill the international emission reduction obligation, but also the guarantee of standardizing the state intervention behavior, and it is the necessity of the development of the times.

2.2 The need to implement international obligations to develop a low-carbon economy

Low-carbon economy needs institutional guarantee, which is the objective requirement for countries to implement their international obligations to reduce greenhouse gas emission reduction, and it is also a realistic guarantee to

ensure the smooth implementation of low-carbon economy. Changing the thinking of traditional economic development and choosing an economic development path that can effectively deal with climate change in accordance with the requirements of the Convention is the goal pursued by all countries, and the concept of low-carbon economy makes this goal a reality. The low-carbon economy is in line with the general direction of world economic development in the future. It is to reduce greenhouse gas emissions while developing the economy. In line with the idea of international conventions of “coordinating action to address climate change with social and economic development in an integrated manner”. Reflecting the concept of “protecting the climate system for the benefit of present and future generations of mankind” and recognizing the spirit of the convention that “actions to address climate change can be economically justified in themselves and can also contribute to the resolution of other environmental problems”, It is an economic development road that embodies the concept of international conventions and takes into account the dual objectives of economic development and greenhouse gas emission reduction. It is the implementation and implementation of the development principles and greenhouse gas emission reduction principles established by international conventions. Is a way to effectively implement the greenhouse gas emission reduction obligations established in international conventions (Hou XG 2017).

3 Prediction Model of carbon Emission from Ecological Environment under the Law of low carbon economy

3.1 Sample pretreatment

Combined with the law of low-carbon economy, the coal consumption and carbon emissions in 2013 and 2017 are selected as the overall sample, in which the data of the first five years are used as the training samples and the data of the last five years as the test samples. The input variables are coal consumption and carbon emissions data over the years, and the output variables are coal consumption and carbon emissions data for future years. We use the maximum-minimum normalization method to normalize the original data, as follows:

$$x' = \frac{x - x_{\min}}{x_{\max} - x_{\min}} \dots\dots\dots (1)$$

In the form, x is the original sample data; x_{\max} , x_{\min} is the largest and minimum value of the original data, respectively; x' is the data after normalization transformation.

3.2 Establishment of Prediction Model

The Sigmoid function is used as the carbon emission function of the ecological environment, that is:

$$f(s) = \frac{1}{1 + x'} \dots\dots\dots (2)$$

The output layer of this model is a single coal consumption or carbon emission. The specific steps of predicting coal consumption or carbon emissions by BP neural network method are as follows:

- (1) sample normalization, so that the values of all data are between (0, 1);
- (2) to determine the initial structure of the network;
- (3) set the training function, learning function, transfer function, training step number and training accuracy of the network;
- (4) initialization of weights and threshold values, and the first value is as small as possible;
- (5) training network;

- (6) to determine whether the network converges quickly and meets the error requirements, if not, returns (4);
- (7) the network prediction value is obtained from the test sample, and the predicted value is compared with the actual value to see if the prediction error meets the requirements. If not, it returns (4);
- (8) to predict the target.

4 The path Choice of Building a low-carbon Society

According to the prediction model of ecological environment carbon emissions, the path of low carbon society is selected. So, how can this be achieved? First, we should establish low-carbon values. The core idea of this value is to emphasize the role of ecological value, to change the position of “humanitarianism”, and to take man no longer as the only yardstick in examining human economy, society and life, but to take fully into account ecological factors. Realize the harmonious coexistence between man and nature. Second, it is necessary to establish a low-carbon code of conduct. Low carbon law, low carbon policy and low carbon morality are all effective means to restrain high carbon behavior. The formulation of perfect low-carbon laws and policies can correctly guide people’s low-carbon behavior, punish violations of low-carbon regulations, and control carbon emissions from the perspective of heteronomy. The establishment of low-carbon morality is to strengthen the psychological consciousness of low-carbon from the level of self-discipline, so that low-carbon behavior becomes the conscious cultivation and active choice of human beings. Under the joint action of heteronomy and self-discipline, the formation of low-carbon concept can have sufficient system and ideological guarantee. Third, strengthen the popularization and education of low-carbon knowledge. Human cognition of truth is often first grasped in the hands of a few people, and only by continuously popularizing the knowledge of truth can it be gradually accepted by more and more people and become the consensus of human beings.

4.1 Replace “growth economy” with “ecological economy”

The “growth economy” first emphasizes the expansion of production growth. The troika, investment, consumption and export, which drive economic development, are all based on the improvement of production capacity: investment to achieve production, consumption to stimulate production, export to expand production, Rely on the increasing production to reflect the vitality of the economy and the growth of wealth. However, this mode of economic growth does not take into account the constraints of the ecological boundary, the raw materials in the production premise, the energy consumed in the production process, and the waste generated in the production results all need to be provided or recovered by nature. When production straddles the limits of nature, production is no longer to create wealth for human beings, but to accelerate the demise of human beings. Marx once pointed out in the manuscript of Economics and philosophy in 1844: “Nature, as far as it is not a human body, is a human inorganic body.” Man is a part of nature and human beings cannot survive without nature. In order to slow down the opposition between human beings and nature, human beings need to change the development model of one-sided pursuit of production expansion and replace the unlimited “growth economy” with “ecological economy”. While pursuing economic growth, we should take into account the limits that the ecological environment can bear, replace extensive growth with intensive production, reduce waste of resources, reduce environmental pollution, and realize the sustainable development of human society. Therefore, in the path choice of creating a low-carbon society, it is necessary for people to improve the efficiency of the use of existing energy, speed up the development and utilization of clean energy, and investigate the effect of economic growth with green GDP with low pollution and low energy consumption. The low carbon energy system, low carbon technology innovation system and low carbon industry system with energy saving and emission reduction as the core are

constructed.

4.2 Replace “regional governance” with “global governance”

Because of its unique nature, the problem of carbon emission poses a new challenge to the treatment of traditional environmental pollution. In the traditional political governance model of environmental problems, the state is usually led by the state, giving full play to the role of the government and the market. The “visible hand” of the government mainly controls the social economy through the formulation of principles and policies, restricts social production and destroys the environment by life. The “invisible hand” of the market increases the cost of environmental pollution through price leverage, reduces the market competitiveness of polluting enterprises, and ultimately extrudes the economic behavior of environmental damage out of the market. But in the treatment of carbon emissions, both hands suddenly lost their power: the “visible hand” lost the power to regulate, and the “invisible hand” lost the ability to regulate. This is because these two hands grow on the body of “one country’s economy”. Without the support of national interests and national economy, these two hands can only become paralyzed hands.

5 CONCLUSIONS

In today’s frequent ecological crisis, although there are many calls to reduce carbon emissions, protect the atmosphere and protect the environment, it is obvious that ordinary people can not be easily accepted at the expense of their current interests to accept low-carbon rationality. This requires stronger publicity and popularization of low-carbon knowledge, the establishment of a low-carbon knowledge system related to economic development theory, social development theory and philosophy of daily life, so that people can generally master and apply low-carbon theories and skills. Take the initiative and practice low-carbon action rationally. Through the prediction of coal consumption and carbon emissions in China, we can see that the road of energy saving and emission reduction in China is still difficult, so the following policy suggestions are put forward:

(1) Rely on scientific and technological progress and policy guidance to improve energy efficiency and vigorously develop and use new energy. The energy storage structure and economic structure of our country determine that the energy structure dominated by coal is unlikely to change in the short term. We should strengthen scientific and technological innovation, improve the efficiency of coal utilization, and explore and develop new energy sources. To provide scientific and technological guarantee for the transformation of energy structure in the future, and to establish a stable, economic and safe energy supply system. At the same time, improve the recycling of carbon, reduce carbon emissions.

(2) Actively draw lessons from the international advanced experience, perfect the energy laws and regulations, establish the early warning mechanism, reserve mechanism and crisis emergency mechanism of energy security in our country. We will improve the detection system of air environmental pollution, strengthen contacts with all countries in the world, and jointly deal with the global warming crisis. Strengthen the law enforcement efforts of relevant departments, strengthen the punishment of illegal acts, and jointly create a good energy environment and atmospheric environment.

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