Feasibility Research on Incentive Measures for Adopting Environmental Friendly Technology

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Abstract. This research focuses on the design of environmentally-friendly technologies with incentives as the main research object. Through systematic review and analysis of the current status and decision characteristics of environmentally-friendly technology adoption, it collects data and determines the user's motivation and behavior measurement index system, so as to build environmentally-friendly technology adoption motivations and behaviors. Measure the model, and then use the structural equation fitting method to evaluate the user's motivation and behavior model. Based on this, set the environmental protection technology to use the incentive model, and use the experimental economics paradigm to conduct scientific tests to determine the effective incentives for environmental protection technology. Methods to provide scientific and applicable reference and reference for the formulation of incentive measures for enterprises and related institutions.

1 Introduction

According to "new scientist", Chris Goodall, a famous climate expert, has published a new book called "ten technologies to save the earth", saying that if we use ten new technologies, we can avoid the earth's devastating climate disaster. Although the environmental protection technology has already been introduced, but is not used much in our country, people have been calculating the cost and maintenance of adopting the environmental protection technology, adopting the harmful traditional technology, but ignored the environmental pollution [1]. Although the government has been encouraging enterprises and individuals to adopt environmental protection technology to engage in production, the effect is not significant. Therefore, the design and implementation of incentive measures is particularly important. The main purpose of this study is to find out which way can effectively encourage the adoption of environmental protection technology and which way can achieve better results.

2 Research Design

Firstly, to explore the current status and prospects of environmentally friendly technology adoption. By consulting data and literature, systematically sort out the current status and development prospects of environmentally-friendly technology adoption, and comprehensively compare the costs, risks, economic benefits and environmental benefits of traditional old technologies and environmentally-friendly new technologies[2].

Secondly, to analyze the characteristics of technology adoption decision-making. Introducing the prospect theory of exploring risk scenarios (Kahneman and Tversky, 1979) into the study of technology adoption decision-making, from the perspective of psychology and economics, comprehensive analysis of the subjectivity of users in technology decision-making in technology uncertainty cognitive[3], which can better analyze the characteristics of users’ decision making behaviors in the adoption of environmentally friendly technologies, including features such as utility maximization pursuit, neutral profit and loss point dependence, loss aversion, selective perception, and anchoring effects.
Thirdly, to explore motivation and behavior measurements of the environmentally-friendly technologies. According to the relevant analysis of psychology and behavior, the user's motivation for psychologically demanding environmentally-friendly technologies has led to the user's adoption behavior. Therefore, this research will analyze the user's motivations in-depth (including internal motivation, external motivation) and adoption behavior (including active adoption, cooperative adoption, and passive adoption) [4]. Collect data through actual market research, determine the measurement index system for motivation and behavior, and build environmentally-friendly technology adoption motivation and behavior. Measure the model, and then use the structural equation fitting method to evaluate the user's specific patterns of motivation and behavior.

Fourthly, to carry out economic experiment of incentive experiments for environmental friendly technology. Design the "adopt motivation-incentive behavior-adopt behavior" model of environmental-friendly technology, adopt the research paradigm of experimental economics, and select users to participate in controlled conditions for 8 rounds (A total of 18 different incentive scenarios) environmental protection technology adoption experiments, examining the benefits and incentive policies of different environmental protection technologies at a fixed rate of return, and testing the impact of relevant incentive variables on user technology adoption decisions[5].

Fifthly, to propose incentive recommendations for environmentally-friendly technologies. Based on results of experimental economics, determine effective incentives for environmentally-friendly technologies, propose incentives to promote the adoption of environmentally-friendly technologies, and stimulate users' effective demand for and adoption of environmentally-friendly technologies.

3 Developing Trends of Environmental Friendly Technology

(1)Foreign environmental protection and development of environmental protection industries

In the 21st century, the global environmental protection industry has begun to enter a stage of rapid development, and the environmental protection industries in the United States, Japan, and the European Union have become the main forces in the global environmental protection market. The U.S. environmental protection industry is mainly composed of three categories: environmental protection equipment, environmental protection resources, and environmental protection services. From the production scale Look, the total output value of the U.S. environmental protection industry in 1970 was 39 billion U.S. dollars, accounting for 0.9% of its GDP. The growth rate of the U.S. environmental protection industry from 1985 to 1990 was 5% to 12%, and from 1991 to 1996 it was 1% to 5%. 2003 The total output value of the U.S. environmental industry was 301 billion U.S. dollars in the last 30 years, with an average growth rate of nearly 7%, while the average annual growth rate of the United States GDP was 2% to 3%, accounting for 2.74% of the United States gdp. The company realized a profit of 20 billion U.S. dollars, and created a profit of 45 billion U.S. dollars [6]. In 2008, the total output value of its environmental protection industry has increased to 315.7 billion U.S. dollars, and it has absorbed 1.87 million people. In 2010, the output value reached 357 billion U.S. dollars, and 5.39 million people were employed. From the perspective of corporate structure, there are about 150,000 environmental protection companies in the United States, mainly in two forms: first, municipalities and other public entities, which mainly provide drinking water, waste water treatment, and solid waste management; and second, as the United States environmental protection The rapid rise of private industry Enterprises, mainly engaged in pollution remediation, pollution control and other businesses.

(2)Development of domestic environmental protection and environmental protection industries

Since 2007, environmental protection expenditure subjects have been formally incorporated into the national budget. The government has proposed new ideas and new countermeasures for environmental protection work. Benefiting from this, China's environmental protection industry has continued to grow at a high speed and the growth rate has further increased. In 2007, China adopted a comprehensive Measures were taken to promote pollution reduction. The proportion of coal-fired
generating units equipped with facilities in the country's total thermal power units increased from 12% in 2005 to 48%, and the urban sewage treatment rate increased from 52% to 60%. National chemical oxygen demand throughout the year Emissions were 13.833 million tons, a decrease of 3.14% over 2006; sulfur dioxide emissions were 24.681 million tons, a decrease of 4.66% over 2006, and the emissions of major pollutants achieved a double decline. In the second half of 2008, affected by the U.S. financial crisis, China expanded Domestic demand has increased infrastructure construction on a large scale, and investment in environmental protection industries has further increased.

At present, China's environmental protection industry is still at a stage of rapid development, and its overall scale is relatively small. Its boundaries and connotations continue to be extended and enriched [7]. With China's social and economic development and industrial structure adjustment, China's environmental protection industry has directly contributed to the national economy. It will change from small to large, and gradually become an industry that improves the quality of economic operations, promotes economic growth, and improves the level of economic and technological development.

4 Existing Problems and Solving Solutions

Based on the previous data collection and preliminary investigation, and the analysis of the application of many new environmental protection technologies in China, this study focuses on the following aspects of the incentive methods adopted by environmental protection technologies:

How to solve the problem that society has a lower need for environmental improvement? Compared with traditional technology, how to solve the problem of low awareness of environmental protection technology adoption in society? Compared with traditional technologies, how to solve the problem of higher cost and higher technical risks of environmentally friendly technologies? Compared with traditional technologies, how to solve the problem of high expected benefits of environmentally friendly technologies, but low immediate benefits? How to solve the problem that most of the society adopts environmental protection technology to follow the adoption decision?

Accordingly, we propose these solving solutions (see Fig.1):

- **Low environment demand**
  - Enhance environmental awareness and popularize environmental awareness

- **High cost, high risk**
  - Strengthen technological innovation, improve material utilization, reduce cost and risk

- **Low spot income**
  - Increase the amount of government subsidies

- **Low level of social cognition**
  - Strengthen the publicity of new technology and improve the public recognition

- **Take a follow-up decision**
  - Looking for representative demonstration and guidance

![Figure 1. Solving solutions for incentive measures of environmental friendly technology.](image)

As shown in Fig.1, the solutions considered are just as above-mentioned: Firstly, Adopting an incentive method, to enhance environmental awareness and popularize environmental awareness. Secondly, adopting incentive measures, to strengthen the promotion of environmental protection technology and reduce the application of conventional technology. Thirdly, adopting incentive methods, to reduce technical costs and risks. Fourthly, adopting incentive measures, to effectively increase government subsidies. Fifthly, adopting incentive methods, to make demonstration and have leading effects.
5 Conclusion

This project studies the user's adoption behavior of environmental protection technology under different influencing factors, and obtains the most influential factors and the most effective incentive and measures. It solves the blind area and low effect of incentive measures formulated by enterprises and institutions, and provides scientific and appropriate reference for the formulation of incentive measures by enterprises and relevant institutions.

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