

Incentive Mechanism and Policy Suggestions of Eco-Taxation System for Low-Carbon Transformation of Enterprises

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Abstract

This study is devoted to discussing the role of eco-taxation system in promoting low-carbon transformation (LCT) of enterprises, and puts forward corresponding policy suggestions. In terms of methods, this article analyzes the basic principles, components and dual roles of eco-taxation system in ecosystem preservation and socioeconomic advancement, and constructs a theoretical framework for eco-taxation system to promote LCT of enterprises. Furthermore, this study deeply discusses the mechanism of eco-taxation system to stimulate LCT of enterprises through price mechanism, cost effect and innovation incentive. It is found that the eco-taxation system effectively guides enterprises to adopt low-carbon production mode and helps the green upgrading of industrial structure. However, in the process of implementation, there are also problems such as tax burden and tax evasion. In view of these problems, this study puts forward a series of policy suggestions to optimize the eco-taxation system, and emphasizes the responsibility of the government in implementing the eco-taxation system. Policy suggestions include adjusting tax structure and improving tax preferences. This study provides targeted suggestions for policy makers and provides theoretical basis and practical reference for promoting LCT and long-term development of enterprises.

Keywords: eco-taxation system, low-carbon transformation, incentive mechanism, policy suggestions, long-term development

1. Introduction

The severity of global climate change and ecosystem preservation has become a key issue that human beings must face directly. Its urgency is increasing day by day, which should not be underestimated [1]. The rapid process of industrialization has led to a large quantity of greenhouse gas emissions. This has triggered significant changes in the global climate system, such as the increase of extreme weather events, rising sea level, melting glaciers and the sharp decline of biodiversity [2]. These environmental problems pose a threat to the living environment of human beings and also bring great challenges to socioeconomic advancement [3]. In view of this, the global community must work together and take practical measures to deal with climate change and protect the earth's homeland.

As an important way to deal with climate change, LCT has been widely recognized by the global community [4]. This transformation means changing from an socioeconomic advancement model that relies on high-carbon energy and emission-intensive industries to a low-carbon, environmentally-friendly and long-term development path [5]. This requires pursuing high efficiency and cleanliness in energy utilization, reducing dependence on fossil energy and increasing the proportion of renewable energy [6]. In terms of industrial development, we will promote the upgrading and transformation of traditional industries and cultivate low-carbon emerging industries. In life style, advocate green consumption, reduce waste and improve resource utilization efficiency. LCT is helpful to slow down the speed of climate change, promote the long-term development of economy and improve the quality of human life [7]. Realizing LCT is a complex task. This requires the joint efforts of the government, enterprises and the public, among which the role of policy tools is particularly critical.

As an innovative policy means, eco-taxation system plays an important role in promoting the LCT of enterprises. It internalizes the environmental cost through the tax mechanism, and makes the polluter bear the corresponding responsibility [8]. The value of eco-taxation system is not limited to the economic level, but also lies in its far-reaching social and environmental benefits [9]. Although the eco-taxation system has many advantages in promoting the LCT of enterprises, its application in practice also faces some challenges [10]. For example, how to

prevent enterprises from tax evasion and ensure tax collection and management; How to coordinate the relationship between eco-taxation system and other policy tools, and form a policy synergy [11]. These are all problems that need to be studied in depth. The purpose of this article is to explore how the eco-taxation system encourages enterprises to transform into low-carbon enterprises, and put forward corresponding policy suggestions. The research will start with the basic principles and components of eco-taxation system, and analyze its incentive mechanism and action path; Combined with the actual situation, this article puts forward specific suggestions to improve the eco-taxation system and promote the LCT of enterprises. It is hoped that this research will provide a reference for government decision-making, offer guidance for enterprise transformation, and make contributions to the long-term development of China's economy.

2. Theoretical basis of eco-taxation system and LCT

Eco-taxation system is essentially an innovative strategy to integrate ecosystem preservation concept into tax system. Following the principle of "polluter pays", it intervenes in environmental destruction and excessive use of resources by means of taxation [12]. Its purpose is to urge enterprises and individuals to reduce pollution and improve the efficiency of resource use. The elements of the tax system include tax target, tax rate, tax base and tax preference (Table 1). Together, they constitute its core architecture, which ensures its incentive and restraint effects in actual operation.

Table 1. Detailed Components of Eco-taxation System

Component	Description	Policy Aim	Examples/Remarks
Tax Objective	Ecosystem preservation and efficient resource utilization	Promote sustainable environmental development	Ensure the environment is protected and resources are utilized reasonably
Tax Rate	Set according to the degree of pollution or resource usage	Incentivize reduction of pollution and waste of resources	Higher tax rates for high pollution/high consumption behaviors to penalize and guide improvement
Tax Base	Pollution behavior or resource usage	Provide a specific measurement basis for taxation	Such as CO ₂ emissions, wastewater discharge, etc., as the basis for taxation
Tax Incentives	Provide tax reductions or exemptions for environmental behaviors or resource conservation	Encourage environmental behaviors and technological innovation	Such as tax reductions for enterprises adopting clean energy, as an incentive

Eco-taxation system plays a dual role in ecosystem preservation and socioeconomic advancement [13]. On the one hand, by increasing the cost of polluters, it effectively inhibits environmental pollution behavior and helps improve environmental quality. This "negative incentive" mechanism has effectively curbed the trend of environmental deterioration and laid a solid foundation for long-term development. On the other hand, the eco-taxation system encourages enterprises to invest in ecosystem preservation technology and clean energy through preferential tax policies, and promotes the transformation of industrial structure to green and low carbon [14]. This "positive incentive" mechanism has promoted the transformation of economic growth mode and injected new vitality into socioeconomic advancement.

Low-carbon transition refers to the transition of social and socioeconomic advancement mode from high carbon to low carbon. Its core lies in reducing fossil energy dependence, reducing greenhouse gas emissions, improving energy efficiency and the proportion of clean energy [15]. The goal of LCT is to achieve a win-win situation of socioeconomic advancement and ecosystem preservation, that is, to effectively meet the challenges of climate change while maintaining economic growth. This transformation involves technological innovation, industrial structure adjustment and energy structure optimization. There is a close internal relationship and mechanism between eco-taxation system and LCT. Eco-taxation system guides enterprises to adopt low-carbon production mode through tax leverage, and promotes the adjustment of industrial structure to green and low-carbon. The promotion of LCT also provides impetus and direction for the improvement of eco-taxation system [16]. With the

continuous development and application of green technology, the tax object and tax rate of eco-taxation system need to be adjusted accordingly to meet the new requirements of LCT. Therefore, the eco-taxation system and LCT promote each other and complement each other, and jointly promote the socioeconomic advancement in a greener, low-carbon and sustainable direction.

3. Analysis on the Incentive Mechanism of Eco-Taxation System for LCT Of Enterprises

3.1 Multiple Ways of Eco-Taxation Incentive Mechanism

As a policy means to promote LCT of enterprises, eco-taxation system plays a key role in its diversified incentive mechanism. The tax system affects the behavior of enterprises through the price mechanism, and taxes products with serious pollution and high energy consumption, which leads to the price increase of these products, thus reducing consumer demand. The transmission of this price signal forces enterprises to re-examine their own production processes and product structures and look for more environmentally friendly and energy-saving production methods. In order to reduce production costs and adapt to changes in market demand. The eco-taxation system also provides tax incentives for enterprises that adopt clean energy and energy-saving and emission-reduction technologies. This makes these enterprises more competitive in the market and encourages more enterprises to devote themselves to the research and development and application of low-carbon technologies.

In terms of cost effect, the eco-taxation system increases the production cost of enterprises by taxing industries with high pollution and high energy consumption. This kind of cost pressure urges enterprises to seek ways to reduce costs, and adopting clean energy and energy-saving and emission-reduction technologies is one of them. Through technological innovation and improvement of production methods, enterprises can reduce energy consumption and pollutant emissions, and reduce the environmental tax burden. This cost effect promotes enterprises to realize LCT, improves the efficiency of resource utilization and enhances the market competitiveness of enterprises. The eco-taxation system also promotes the R&D and application of low-carbon technologies through innovation incentives, as shown in Figure 1:

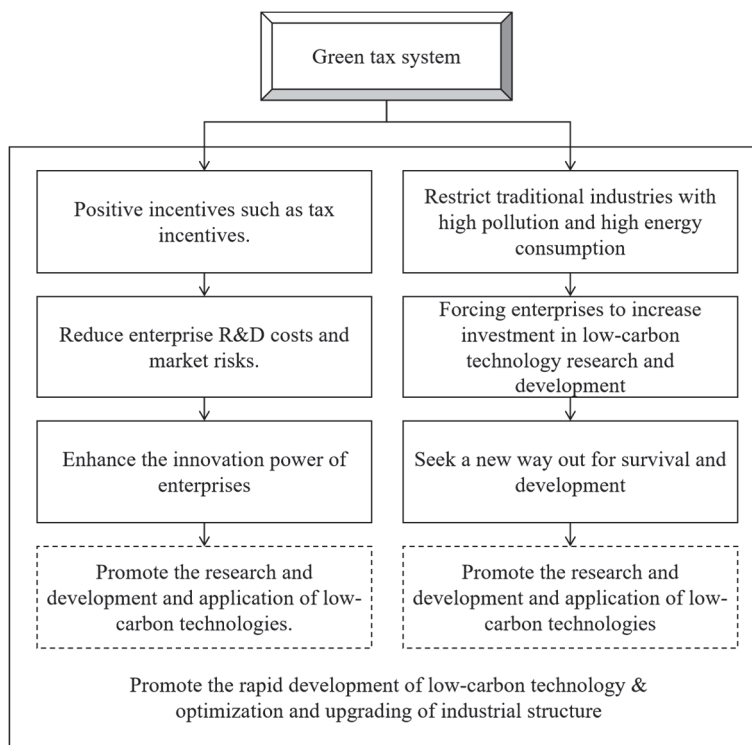


Figure 1. Schematic diagram of eco-taxation system's incentive to low-carbon technological innovation

As shown in Figure 1, on the one hand, tax incentives reduce the R&D costs and market risks of enterprises and stimulate innovation. On the other hand, the restrictions on traditional industries urge enterprises to increase investment in green technology research and development and seek new development paths. This innovation incentive accelerates the development of green technology and promotes the optimization and upgrading of industrial structure. This laid the foundation for sustainable socioeconomic advancement. Generally speaking, the

eco-taxation system has effectively promoted the LCT of enterprises through various measures such as price mechanism, cost effect and innovation incentive. These interactive incentive mechanisms together constitute a powerful driving force to promote the low-carbon development of enterprises.

3.2 Problems and Challenges in the Implementation of Eco-Taxation System

The implementation of eco-taxation system is not smooth sailing, but it has also encountered challenges and problems. The first thing is the reasonable allocation of tax burden, which has become an urgent task. Implementing a eco-taxation system may increase the tax burden of enterprises. For those industries that have long relied on high pollution and high energy consumption production mode, the increase of tax burden is particularly prominent. In the case of uneven distribution of tax burden, some enterprises may fall into operational difficulties and even go bankrupt and close down because of being overwhelmed. Therefore, how to scientifically set taxes and tax rates to ensure the fairness and efficiency of the tax system is a problem that must be carefully considered when implementing the eco-taxation system. Tax evasion constitutes another big challenge in the implementation of eco-taxation system. Because the collection object of eco-taxation system involves the production behavior and products of enterprises, some enterprises may evade taxes through various means. For example, enterprises conceal the real situation of energy consumption and pollutant discharge; Avoid taxes by means of transfer pricing. This kind of tax evasion not only harms the national tax interests, but also undermines the fairness and effectiveness of the eco-taxation system. In combination with the above, strengthening tax collection and management and preventing tax evasion by enterprises are issues that must be highly valued when implementing the eco-taxation system.

In addition, the eco-taxation system may encounter many other difficulties in the process of implementation. For example, the synergy between eco-taxation system and other policy tools. How to realize the synergy between eco-taxation system and other policy tools is a key problem that must be solved in the process of implementation. As a policy means to promote the LCT of enterprises, the eco-taxation system needs to cooperate with other relevant policy tools to make joint efforts. However, in actual implementation, the differences between different policy-making and implementing departments may lead to friction or even opposition between policies. This will not only affect the effectiveness of the eco-taxation system, but also bring extra pressure and uncertainty to enterprises.

3.3 Suggestions and Measures to Improve the Incentive Mechanism of Eco-Taxation System

In order to optimize the incentive system of eco-taxation system and ensure that it can effectively drive enterprises to transform to low carbon, the following are some suggestions and countermeasures:

(1) The primary task is to scientifically allocate taxes and tax rates to ensure the fairness and effectiveness of the eco-taxation system. When building a eco-taxation system framework, it is needed to comprehensively consider the specific conditions of enterprises in various industries and regions, and set taxes and tax rates reasonably to prevent the tax burden from being biased or light. Furthermore, we should strengthen the supervision of tax collection and management process to ensure the fairness of tax collection. For enterprises that actively adopt low-carbon technologies and realize LCT, the government should provide more tax breaks and incentives. In this way, more enterprises will be encouraged to move towards low-carbon development.

(2) Strengthen tax collection and management, and put an end to tax evasion by enterprises. In order to ensure the effective implementation of the eco-taxation system, we should strengthen the tax collection and supervision of enterprises and establish a sound tax collection and management system. By strengthening tax inspection and perfecting tax declaration system, enterprises can be prevented from tax evasion. Furthermore, we should increase the punishment for tax evasion, raise the illegal cost and protect the national tax rights and interests.

(3) Coordinate the relationship between the eco-taxation system and other policy tools to form a policy synergy. When formulating and implementing the eco-taxation system, we should fully consider the influence and role of other relevant policy tools and strengthen coordination and cooperation among policies. Through policy combination and synergy, it forms a powerful driving force to promote the LCT of enterprises. As shown in Table 2:

Table 2. Synergy between Eco-taxation and Other Policy Instruments

Policy Instrument	Impact and Role	Coordination and Integration with Eco-taxation
Carbon	Promotes carbon reduction	Eco-taxation can be linked to carbon prices to jointly

Trading Market	through price mechanisms	form reduction incentives
Energy Conservation and Emission Reduction Policies	Directly drives energy conservation and emission reduction in enterprises and industries	Eco-taxation can complement the shortcomings of energy conservation and emission reduction policies, enhancing their effectiveness
Renewable Energy Subsidy Policies	Encourages the use and investment in renewable energy	Eco-taxation can impose taxes on non-renewable energy use, forming a contrastive incentive with subsidy policies
Environmental Regulations	Sets environmental standards and penalty mechanisms	Eco-taxation can serve as an economic means of enforcing regulations, enhancing their effectiveness
Technology Innovation Policies	Supports research and application of low-carbon technologies	Eco-taxation can provide tax incentives for green technology research and development, promoting technological innovation

(4) Strengthen the publicity and education of the eco-taxation system, and improve the public's awareness and participation in ecosystem preservation. By strengthening the publicity and education of the eco-taxation system, people can realize its importance and enhance their awareness of ecosystem preservation and sense of responsibility. In a word, optimizing the incentive system of eco-taxation system is the key path to promote the LCT of enterprises. Through scientific allocation of taxes and tax rates, strengthening tax collection and management, coordinating policy relations, and intensifying publicity and education, we can further improve the incentive system of eco-taxation system and urge it to play a better role in promoting LCT of enterprises.

4. Suggestions on Eco-Taxation Policy to Promote LCT of Enterprises

4.1 Specific Policy Recommendations to Optimize the Eco-Taxation System

Based on the in-depth analysis of the incentive mechanism of eco-taxation system and the potential problems in its implementation, this section puts forward specific policy suggestions for the optimization of eco-taxation system. Optimizing the tax structure is very important for the promotion of eco-taxation system. At present, China's eco-taxation system involves resource tax and ecosystem preservation tax. The application scope and collection intensity of these taxes need to be further strengthened. In order to effectively promote the LCT of enterprises, the government should expand the coverage of eco-taxation and include more products and behaviors with serious pollution and high energy consumption into the taxation category.

Table 3. Proposed Expansion of Eco-taxation Categories

Products/Activities to be Included in Tax Scope	Reason
Highly Polluting Products (e.g., certain chemicals)	Severely pollute and cause long-term negative impacts on the environment
High-Energy-Consumption Products (e.g., certain industrial equipment)	Consume high levels of energy, increase CO ₂ emissions, and hinder low-carbon development
Single-Use Plastic Products	Difficult to degrade, causing significant waste pollution
High-Carbon-Emission Vehicles	Emit large amounts of carbon, exacerbating global climate change
Excessive Packaging Practices	Waste resources and increase the burden on environmental processing
Highly Polluting Industrial Processes	Produce large amounts of harmful substances during production, polluting the environment

Table 3 lists the products and behaviors suggested to be included in the scope of eco-taxation collection, and the reasons for their inclusion. It aims to promote the LCT of enterprises and ecosystem preservation more effectively. Besides adjusting the tax structure, perfecting preferential tax policies is also an important part of optimizing the eco-taxation system. China has introduced a series of preferential tax policies for low-carbon technologies. However, the strength and scope of these policies still need to be increased. The government should strengthen tax incentives and provide more tax breaks and deductions for enterprises that adopt clean energy and energy-saving and emission-reduction technologies. In this way, it can effectively promote the LCT of enterprises. Furthermore, the government should simplify the application and approval process of preferential tax policies and improve the operability and convenience of the policies. This will enable more enterprises to enjoy the benefits brought by the policy. In addition, considering the introduction of new eco-taxation such as carbon tax can directly promote the LCT of enterprises. Carbon tax is a kind of tax that taxes the CO₂ emissions of enterprises. Setting a reasonable carbon tax rate can guide enterprises to reduce CO₂ emissions and promote the development and application of low-carbon technologies. When implementing carbon tax, we should fully consider the actual situation and affordability of enterprises, and set the tax rate and scope reasonably to avoid bringing excessive tax burden to enterprises. Furthermore, strengthen the collection and management of carbon tax to ensure the fairness and effectiveness of tax revenue.

4.2 The Role and Responsibility of the Government in the Implementation of Eco-Taxation System

The government should improve the punishment for tax violations, increase the illegal cost and protect the national tax rights and interests. In addition to strengthening supervision, the government should also improve the transparency of the eco-taxation system and enhance public trust and support. Let the public know the operation mechanism and implementation effect of eco-taxation system by making public the relevant information of tax collection and management. The government should also actively respond to public concerns and questions about the eco-taxation system, strengthen communication with the public, and create a good social atmosphere.

In addition, the government should strengthen the publicity and education of the eco-taxation system to enhance the public's awareness and participation in ecosystem preservation. Through various forms of publicity and education activities, the public can understand the importance of eco-taxation system and enhance their sense of environmental responsibility and mission. Furthermore, the government should encourage the public to participate in the implementation and supervision of the eco-taxation system, and jointly create an atmosphere of energy conservation and emission reduction with the participation of the whole society. As the policy maker and executor, the government should constantly improve the laws, regulations and policy system related to the eco-taxation system. By strengthening legislation, the legal status and scope of eco-taxation system are clarified, which provides legal guarantee for tax collection and management. According to the actual situation of socioeconomic advancement, the government should adjust and improve the relevant policies of eco-taxation system in a timely manner to ensure that it keeps pace with the times and meets the needs of the times.

4.3 Synergy Between Eco-Taxation System and Other Policy Tools

Eco-taxation system is an important policy tool to promote LCT of enterprises. It does not exist in isolation, but needs to cooperate with other policy tools to jointly weave a policy network to promote green development. The combination of eco-taxation system and CO₂ emission trading market provides a dual impetus for low-carbon development of enterprises. CO₂ emission trading market is a market mechanism to guide enterprises to reduce CO₂ emissions by setting CO₂ emission quotas and trading prices. The eco-taxation system can complement the CO₂ emissions trading market by taxing CO₂ emissions, and jointly promote enterprises to reduce CO₂ emissions. The two complement each other and jointly promote enterprises to reduce CO₂ emissions. The government can further link tax incentives with CO₂ emission quota allocation, so as to encourage enterprises to participate in CO₂ emission trading more actively and promote the development of low-carbon economy in a wider scope. The synergy between eco-taxation system and industrial policy is shown in Figure 2:

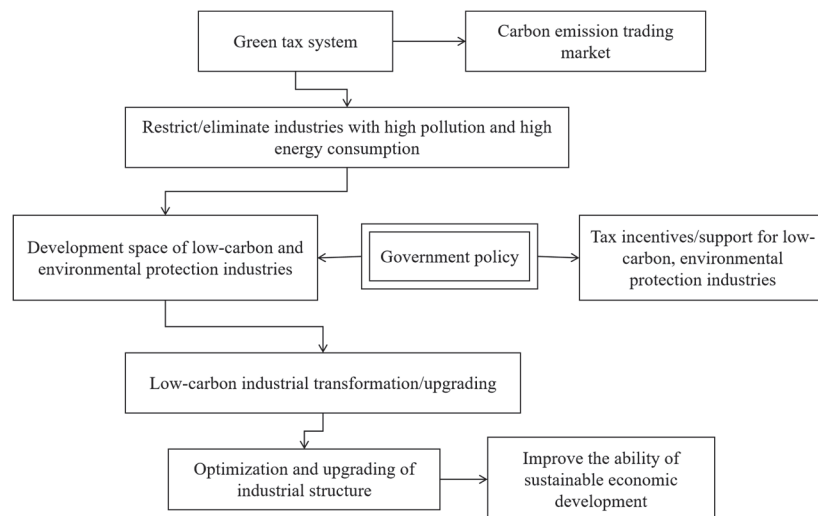


Figure 2. Synergistic effect of eco-taxation system and industrial policy

The coordination of eco-taxation system and industrial policy is very important to promote the transformation of industrial structure to low carbon and ecosystem preservation. In addition to connecting with the CO₂ emissions trading market, the eco-taxation system can also cooperate with industrial policies to jointly promote the optimization and upgrading of industrial structure. The government restricts and eliminates industries with high pollution and high energy consumption through the eco-taxation system, effectively curbing the blind expansion of these industries. This makes room for the development of low-carbon and ecosystem preservation industries. Furthermore, the government gives tax incentives and support to low-carbon and ecosystem preservation industries, and guides them to transform and upgrade to low-carbon and ecosystem preservation.

In addition, the eco-taxation system is closely combined with financial policies and scientific and technological innovation policies, which together constitute a policy system to promote the LCT of enterprises. The government guides financial institutions to increase their investment in low-carbon and ecosystem preservation industries through the eco-taxation system, which provides sufficient financial support for the research and development and application of low-carbon technologies. The formation of this policy system will provide all-round and multi-level support and guarantee for the LCT of enterprises.

To sum up, optimizing the eco-taxation system, strengthening the role and responsibility of the government in the implementation process, and exploring the synergy between the eco-taxation system and other policy tools are important ways to promote the LCT of enterprises. We should constantly improve the relevant policy system of eco-taxation system according to the actual situation of socioeconomic advancement, strengthen supervision and improve transparency. Furthermore, we will ensure the effective cooperation among various policy tools, and jointly promote enterprises to achieve LCT and move towards a long-term development future.

5. Conclusions

In the discussion of this article, the profound influence of eco-taxation system on LCT of enterprises is deeply analyzed. The core point of this article is that enterprises, as the basic unit of economic activities, have the responsibility to reduce CO₂ emissions and promote long-term development in the face of the aggravation of global climate change. As a policy means of paying equal attention to economic incentives and constraints, eco-taxation system is becoming an important tool to promote LCT of enterprises.

The eco-taxation system guides enterprises to adjust their production methods and business strategies through the leverage of taxation. On the one hand, by taxing products and behaviors with high pollution and high energy consumption, the cost burden of enterprises is increased, so as to drive enterprises to seek more environmentally friendly and energy-saving production methods. This "negative incentive" urges enterprises to face up to their own CO₂ emission problems and take active measures to improve them. On the other hand, the eco-taxation system also provides positive incentives such as tax incentives for enterprises that adopt clean energy and implement energy-saving and emission-reduction technologies. This reduces the transformation cost of enterprises and enhances their market competitiveness. More importantly, the implementation of eco-taxation system not only helps enterprises to realize LCT, but also has positive significance for the long-term development of the whole

society. The guiding role of eco-taxation system is helpful to promote the evolution of industrial structure to low carbon and ecosystem preservation, and promote the development of new energy, energy conservation and ecosystem preservation and other emerging industries.

Based on the above, it is very important to emphasize the importance and necessity of eco-taxation system in promoting the LCT of enterprises. The government needs to further improve the framework of eco-taxation system, reasonably set taxes and tax rates, and ensure the fairness and effectiveness of eco-taxation system. Enterprises should also actively respond to the guidance of eco-taxation system, actively adjust production and management strategies, and make contributions to LCT and long-term development. Only in this way can we make progress in the challenge of global climate change and leave a better and more livable earth for future generations.

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